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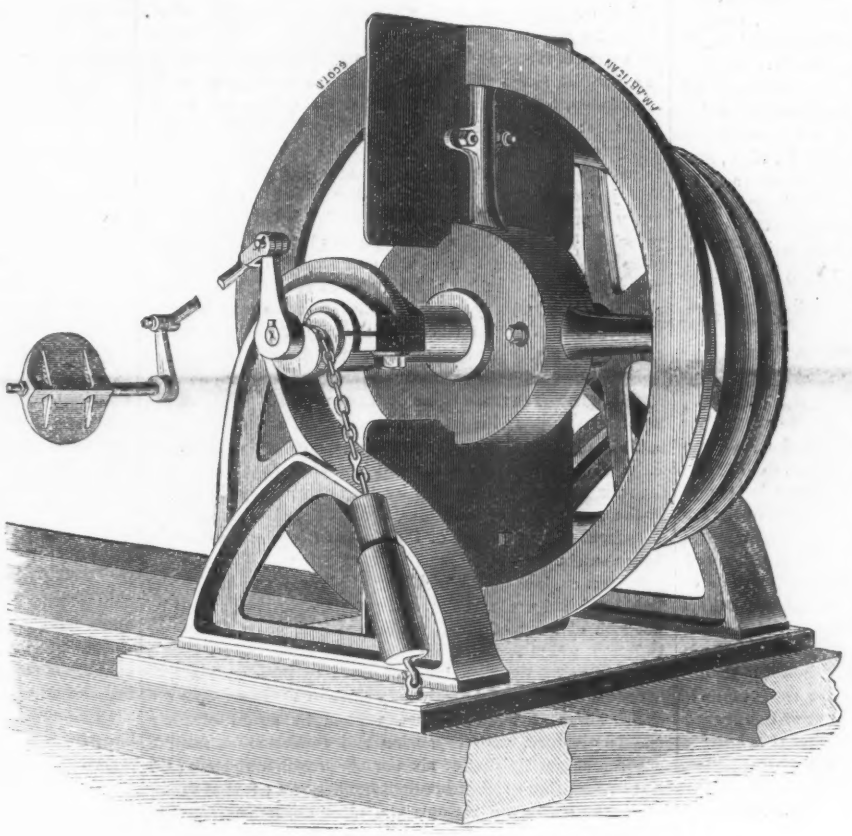
Silver's Improved Marine Governor.

AMONG the various appliances for saving expense and labor on board steam vessels, and promoting their safety in foul weather, perhaps none is of more interest to owners and voyagers by steam on the sea than the means for preventing the engines racing.

The accompanying engraving is an illustrative description of the latest modification of a marine steam engine governor, by Mr. THOMAS SILVER, of New York, whose devices, the first of which was applied to the U. S. Mail steamer Atlantic, of the Collins line, have since been applied to more than a thousand steamers, including those of the principal lines and navies of the world.

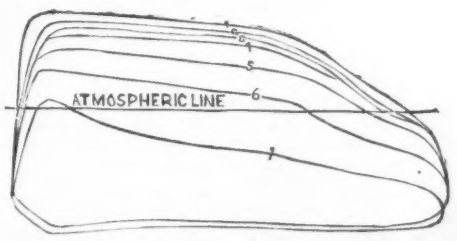
The improved governor consists of a fly-wheel of from two feet to two feet six inches diameter, according to the requirements, carrying vanes, and cast with a large hollow central box or hub, having on one side a tubular projection or sleeve fitted to turn on a central spindle which does not revolve, but is capable of oscillation in fixed bearings. On the other side of the central box or hub there is fitted loosely to the central spindle a detached sleeve, on which is secured the driving-pulley by which motion is received through a belt, to be imparted to the governor by a system of gearing, within the hollow hub or central box of the fly-wheel. The central spur-wheel of this system is fast on the central spindle, and the smaller central pinion is fast to the sleeve of the driving-pulley. Secured in the hollow hub or central box of the fly-wheel are two arbors, each of which has loosely fitted to it a spur-wheel and a smaller pinion, both secured together, the spur gearing with the center pinion, and the attached pinion gearing with the larger central spur-wheel. The motion imparted by the center pinion to the outside spur-wheel causes the pinions attached to the latter to run round the center spur-wheel, and carry the fly-wheel with them with a velocity depending upon the relative sizes of the several spur-wheels and pinions, which may be so proportioned that the fly-wheel may run faster than the driving-pulley.

The lever of the throttle or regulating-valve is connected with an arm on the centre spindle of the governor, and a spiral spring is connected with the said spindle in such manner as to exert a tendency to keep the valve open, said connection being made by an eccentric on the spindle, that the variation in the tension of the spring may be always compensated for. If the engine were running at a proper and absolutely uniform speed, the governor would rotate around the centre spur-wheel on the centre spindle without imparting any motion to the latter, and the spindle would remain stationary, but on the slightest increase of speed the resistance offered by the governor to the accelerated motion of the centre pinion causes the centre spur-wheel to move, and the centre spindle to turn far enough to close the valve.



SILVER'S IMPROVED PATENT GOVERNOR.

The advantages derived from the use of these marine governors are demonstrated by the following "Indicator diagram," taken by Mr. CHARLES FAIRBAIRN, Chief Engineer of the National Steam Navigation Company's screw steamer, *England*, during a gale of wind on the Atlantic.



Annexed is a *resume* of his letter on the subject:—After speaking of the invaluable assistance of the Governor to the engineer, by causing the engines to work in strong weather with as little variation of speed as in a calm, so relieving him of his greatest source of anxiety at times when there is the most urgent necessity for his attention to the engines, he states the important fact that from careful experiment during a heavy gale, he found it to effect a saving of sixteen per cent. on the ordinary consumption of fuel. A reference to the diagram will explain this. The area within that part of each curved line which is above the atmospheric line, represents the volume of steam used in the cylinder during half a revolution of the engines. No. 1 shows the quantity used when the propeller is fully immersed, and the resistance is greatest. No. 2 to 7 show the quantity used while the propeller is gradually rising out of the water, and the Governor is cutting off the supply of steam to the cylinders, in exact proportion to the decrease of resistance, thus maintaining the velocity of the engines without variation.

The mean of these seven areas is expressed by 3.9, whilst the area of No. 1 is 6.5, showing that the Governor has effected a saving of forty per cent. of steam during these seven revolutions; but if the steam had not been cut off by the Governor, the engines would have made two or three times the number of revolutions in the same time, without propelling the ship any faster, so that the saving due to the Governor in this case is really much more than forty per cent. Besides this, the pressure of steam in the boiler is increased, instead of the steam being expended faster than it can be produced, as is generally the case when the engines race.

MR. FAIRBAIRN's remarks may thus be summed up:—That an efficient Regulator in heavy weather means:

1. Saving of fuel.
2. Higher pressure of steam, and better command of the ship in a gale.
3. Less liability to accident or break-down.
4. The engineer has not to neglect his usual duties to stand by the throttle valve.
5. The labor of the stoker is lessened.

As many of our readers will remember the sad fate of the Australian steamer *Royal Charter*, which was lost, with some hundreds of passengers and millions of treasure, off Holyhead, an extract from Mitchell's *Steam Shipping Journal*, of London, Jan. 6, 1860, relating to it, with another simultaneous case, and its bearing upon the use of the Governor, may prove interesting:

"What strikes us as the best point in this new regulator is the security it affords when working a ship off a lee shore. At such a moment the full power of an engine is required to be exerted with comparative safety, but if its spasmodic action injures the screw shaft or machinery it may as well be out of the ship altogether. The engines of the *Royal Charter* could be worked up to 600 horse power, but if at such a critical juncture it was imprudent to drive them at full speed, or if they were so driven, a large amount of force was wasted by the dip of the screw, we can understand why she could not be kept off the iron-bound coast of Anglesea.

Her position on the night of the fatal wreck made it necessary to stem the sea and wind in order, if possible, to avoid the doom which threatened her. The very character of the sea rendered it impracticable to take the best advantage of her engine-power. The gale overpowered, and drove her gradually to leeward; masts and rigging were cut away; they fouled the screw, and her fate was sealed. Could her engines have economized steam when the screw was out of water, and put on full force when submerged, she might either have been kept in open sea, or held on by her cables, without having to endanger the action of the propeller, by floating spars and chain gear. On the same night the screw steamer *Semaphore* crossed from Belfast to Liverpool, encountering the entire force of the hurricane, but she reached the Mersey in safety, though her decks, as she lay alongside the landing stage, presented a most pitiable spectacle, being covered with dead and dying cattle, many with horns broken, and necks and limbs distorted. But throughout this trying passage her officers affirm that the engines kept up an uniformity of action, the ship her speed, and, as a consequence, she answered her helm, and although her cattle on deck and below were killed or drowned, she made port in average time.

"The *Semaphore* was fitted with "SILVER's Patent Governor," and the engineer on making the bar at Liverpool, disconnected it to work the throttle valve by hand, but this latter they did not succeed in accomplishing, so they connected the Governor again, and all went on smoothly. It is such facts as these that give the Governor its value and importance, and from what we have seen of its actual performance, we feel convinced that its application to marine engines will soon become universal."

There are those of experience who are familiar with the causes of the foundering of the steamship *London*, off the south coast of England, about three years since, who affirm that in their opinion the destruction of that ship was the result of the want of a Governor upon her engines, which, being unable to maintain their effective power in a sea-way the ship would not answer her helm, and became unmanageable. While we have referred to extreme cases of distress, which, however, are but too common, returning to the point of commercial economy and convenience in running steamers, which is evinced by the application of the Governor to so large a number of ships, we may refer to the late report of Admiral Poor of the condition of the U. S. flagship *Severn* in a gale. The admiral says: "The *Severn* was not able to keep up more than steerage way, and when she pitched she brought the propeller out of water. The engines raced to such an extent, and the propeller struck the water so forcibly that there was great danger of giving way, and the ship was hauled to under canvas." After so much evidence from well-known practice in such cases where Governors are properly applied, it seems almost needless to say that, in all probability, had the engines of the *Severn* the advantage of such an instrument, there would have been no "racing" of her engines, or necessity for "hauling to under canvas," and no more danger of "giving way" than if the ship had been running in a calm.

It does seem strange that this useful invention, which is of American origin, and so extensively used abroad, should not, at this late day, have been generally applied to our own steamers. The agent of this invention is

THEODORE ALLEN, 45 William street, New York.

Geese Preparing to Lay Golden Eggs.

A FEW days since, five geese, owned by a man living at Mormon Island, California, died from an unknown disease; and on examining the gizzard of one, grain-gold sufficient to make a five-dollar piece was found. The remaining four panned out, each, almost the same amount of the precious stuff. The gold was probably picked up by the fowls near some claims where the miners had been sluicing, and it is presumed that the quicksilver attached to it caused their death.

Spectroscopic Wonders.

THE spectroscope is continuously revealing new wonders in the departments of physics—even astronomy. A Swedish astronomer, ANGSTROM, has succeeded on several occasions in obtaining the spectrum of the luminous arc which bounds the dark circle of the aurora. The light of this arc is almost monochromatic, and exhibits a single brilliant band, situated to the left of the well known group of calcine lines, and (which is very remarkable) not coinciding with any of the known rays or bands of simple or compound gases. Another circumstance which, as the discoverer observes, gives a special and almost cosmical importance to this observation, is this, namely, he succeeded in observing the spectrum of the zodiacal light, and here the same bright band was seen. "Indeed," he adds, "during a star-light night, when the sky was almost phosphorescent, I found traces of this band visible from all parts of the heavens." In addition to the bright band, he also observed in the auroral spectrum traces of three feeble bands, situated near to the line F of the solar spectrum. ANGSTROM'S observations on the aurora were corrected to the winter of 1867-8, and have since been confirmed by himself and several other physicists. The spectroscopic examination of the zodiacal lights completely overthrows the view generally held by astronomers, that this phenomenon is due to the reflection of the sun's lights from a belt of meteors circulating between the sun and the earth, and shows that, like the auroral light, it must be due to magnetic disturbance in the firmament. It may startle some of our readers to learn that, according to Dr. MAYER, of Heilbronn, the discoverer of the law of the conservation of force (although our distinguished countryman, Mr. JOULE, independently arrived at the same grand result), the aurora is indirectly due to the trade winds. In a very elaborate memoir which Dr. MAYER read at the September meeting of the German Scientific and Medical Association, in which he discussed a variety of questions arising out of his theory of the conservation of force, he stated that, in his opinion, the phenomena of terrestrial magnetism are due to the trade winds. He sums up his reasons as follows: The lowest strata of the trade winds assume, by friction with the surface of the sea, an electrical condition the opposite of that of the water. The air then rises under the warmth of the sun, and the colder air from the pole streams in underneath, driving it towards the pole, when, from its high state of electric tension, it produces the aurora. He adds that the constant disturbance of electrical equilibrium which is manifested by the frequently varying direction of the magnetic needle, is due to the greater electric activity of the southern hemisphere than of the northern, owing to the physical conformation of the globe.—*Once a Week.*

American Mining and Metallurgy from a Foreign Standpoint.

Notes of a Tour of Observation, by Professor F. STAPFF, of Sweden, Special Correspondent of THE ENGINEERING AND MINING JOURNAL.

III.

STEAM-HOISTS of two descriptions are used at the Anderren furnaces. One of them is a single donkey engine, driving the drum upon which the wire rope lifting the cage is wound. Two older steam-hoists at Anderren are constructed in the following way: In a rather high vertical driving cylinder moves a piston and piston-rod, the upper end of which is toothed and geared with a cog wheel, fixed on the side of a pulley three or four times larger. The wire rope is slung around this pulley, and runs then over two guiding pulleys in two separate hoisting shafts. On both sides of the wire rope cages are fixed, which alternately ascend and descend in the hoisting shafts, so long as the piston in the driving cylinder is in motion. The length of the piston stroke, the diameter of the cogged wheel, and of the pulley on its side, are so adjusted relatively to one another, and to the height of hoisting, that one piston stroke is sufficient to lift one cage to the furnace top, at the same time lowering the other one to the ground. All hoists at Anderren are governed from above.

Water-hoists of two different descriptions are in use at Lockridge and Kingsland. At the latter place there are under the cages water-tanks, which can be filled from a reservoir at the side of the furnace tops, and are emptied on reaching the ground, their bottom valves being then automatically opened. The two cages are connected by a rope slung over a pulley (between the two hoisting shafts,) which is furnished with a brake. When the water-tank is filled and loaded with two empty cars, and the lower tank emptied and loaded with two charged cars, the latter will rise and the former sink, the rate of motion being regulated by the brake.

The Lockridge hoist is constructed by Mr. THOMAS, after the principle of some of Mr. ARMSTRONG'S water-pressure hoists and cranes. In a horizontal cylinder, about eighteen feet long and two feet in diameter, moves a plunger, which is guided beh[illegible] the cylinder by rollers. Two piston rods penetrating the front end of the cylinder draw a wire rope slung around a pulley, on the side of which is fixed another pulley, three or four times larger, serving as a drum for the hoist rope. When he plunger is pushed back by the pressure of a water column seventy-five feet high, the rope from the smaller pulley is unrolled, the hoist rope being rolled at the same time on the drum, and the cage, loaded with charged cars, lifted. When it reaches the top it strikes against a lever, which opens the valve of a special hydraulic engine, and by this little engine the water valve of the driving cylinder is shut and its exhaust valve opened. The driving cylinder, thereby coming in connection with a direct-acting steam pump, is pumped out, the water being brought back to the reservoir. Now the piston moves back, and the cage, loaded with the empty cars, sinks down. By a hand-lever below, the opposite motion may be effected. The cage being approximately counterbalanced by weights, makes a gentle and easily-regulated movement. Though the whole apparatus is a fine specimen of mechanical workmanship, it seems to be rather complicated, wasteful of power, and subject to frequent repairs. It is scarcely necessary to add that hoists after the same plan as the American ones, are no novelties at European furnaces; and the same can be said, for the most part, of

THE BLAST ENGINES.

Direct-acting blast engines, on a new plan, are in use at Bethlehem and Kingsland. At Bethlehem, one vertical blast cylinder stands at the side of the steam cylinder, the piston-rods of both being connected by a common cross-beam, which is guided on its ends. An axle-shaft bearing two fly-wheels,

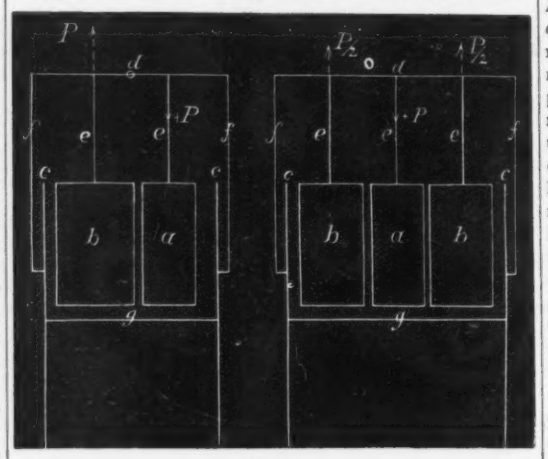


Fig. 4.

a, Steam cylinders; *b*, blast cylinders; *c*, fly-wheels; *d*, cross-beams; *e*, piston-rods; *f*, crank-rods; *g*, fly-wheel shafts.

Bethlehem. *Kingsland.*

with the regulating eccentrics, placed below the cylinders, receives its movement from two crank-rods, which are fixed on both ends of the cross-beam. It is easy to be understood that two parallel forces in opposite directions working upon the cross-beam, tend to turn it, and that the guides and crank-rods must overcome the push and pull occasioned by this tendency to a rotary movement. Of course I was rather surprised to see this engine work softly, constantly, and without remarkable jarring of the crank-rods, giving a blast of five to seven pounds' pressure. The Kingsland engine is built after better principles of theoretical mechanics; two blast cylinders being placed one on each side of the steam cylinder, and a cross-beam connecting the three piston-rods. Of course, if the piston-rods are symmetrically attached to the cross-beam, and the resistance of the compressed air and the sum of dead resistances are equal in both blast cylinders, the cross-beam is not exposed to being turned by the forces communicated to it through the piston-rods. Yet this engine does not work so quietly as the Bethlehem engine; the crank-rods shivered, and one of them had already been broken, occasioning a stop of four days. If the considerable weight of the cast iron cross-beams is one of the reasons for these irregularities, they may perhaps be helped by the application of a lighter, girder-shaped cross-beam of plate iron. The pressure of the blast at Kingsland was about three pounds.

Balance engines built after different plans, some of them of highly-finished workmanship and considerable size, are to be met with at most of the iron works visited, namely: four at Anderren, where two of them, worked by low-pressure steam, give to three furnaces a blast of three to three and a half pounds pressure. Commonly only three of these engines are used. Three at Hokendauqua, worked by steam of forty pounds pressure, with expansion and condensation, furnish four furnaces with blast of six pounds pressure, and are said to represent about fifteen hundred horse-power; four at Lockridge, whereof commonly only two are used, make a blast of six to eight pounds pressure. An arrangement worthy of imitation is made at Lockridge, to keep the blast-cylinders cool by a water current between the cylinders and surrounding sheet-iron covers. If I am right, this is also the case at Kingsland. By such an arrangement, not only waste of lubricating material is prevented, but also power (fuel) is saved in running the blast-engines at high speed. I need not point to the physical fact, that the power consumed for re-heating air by pressure, is practically lost as soon as the compressed air receives the temperature of its environs, and, with this temperature, a lower pressure than it received under the act of compression. Consequently, it is rational to make blast-engines run as slowly as possible, the air then retaining its original temperature also under the act of compression; or, to cool the cylinders as much as possible, the blast then immediately delivering the warmth just obtained by the compression. Both these arrangements are strictly made use of at the Mount Cenis tunnel, where blast of seventy-three pounds pressure is produced for the management of rock drilling machines. Each of the Johnstown furnaces is furnished with two engines, giving blast of three and a half pounds pressure, and at SCHONBERGER'S establishment, blast of three pounds pressure is produced by two engines, supplying two furnaces.

The common style of blast steam engines at the Missouri charcoal furnaces is: horizontal steam cylinder, distribution and regulation of steam by bell-valves, or bell-valves combined with slides. The two blast-cylinders at Iron Mountain are horizontal; their piston rods connect with cranks on the fly-wheel shaft, and one of these cranks is at the same time connected with the piston rod from the steam cylinder. At Pilot Knob, the two blast cylinders stand vertically, and by a couple of cog-wheels and cranks, the movement of the steam piston rod is transmitted to the piston rods of the blast cylinders. At both places, one of the blast-pistons runs one-fourth before the other. The pressure of blast is, at Pilot Knob, two and one-fifth to two and one-fourth pounds; at Iron Mountain No. 2, three and one-half pounds; No. 3, four and one-quarter to four and one-half pounds. In connection with these notes on blast engines, some words may be allowed concerning

THE BLAST RE-HEATING FURNACES.

At most of the establishments visited, they were located close below the furnace tops, upon arched or timbered floors; but the blast re-heating furnaces of a later date, and one under construction at Irondale, have their foundations not far above the level of the ground, and are provided with high chimneys. At Irondale, the oven is divided into two compartments, each of them possessing a special chimney. The blast can be directed at will through the re-heating pipes in both compartments; or, if one of them should be under repair, through the pipes of one compartment only. The most common cast-iron re-heating tubes are cylindrical, of ten to fifteen feet in length, ten inches in outer diameter; they are cast two-and-two, in one piece, connected by a knee. At Mr. SCHONBERGER'S establishment, re-heating pipes of another description are in use, namely, cylindrical pipes, divided by vertical walls into two half-cylinders. In all re-heating blast-furnaces which I saw, the pipes had a vertical position upon iron chests, through which the blast is conducted from one pipe couplet to the next; the gas from the blast furnaces serving as fuel, is led into the re-heating oven from the side, or vertically upwards from a receiver below the oven, through holes between the chests upon which the pipes rest.

The temperature of blast was, at Anderren, 500° to 800°, Fahrenheit; Bethlehem, 400° to 500°; Hokendauqua, (sixty double pipes in one oven) 1,100°; Lockridge, (ninety double pipes) 1,100°; Johnstown, 800°; SCHONBERGER, BLAIR & Co., 1,100°; Pilot Knob, 600°; Iron Mountain No. 2, 500°; No. 3, 550° (twenty double pipes, formerly fifteen); Kingsland, 750° (twenty-seven double pipes.) Naturally these figures, which refer to the period when I visited the localities here named, and the pig-iron then made, differ with the sort of pig-iron to be produced, and with many other circumstances. In Missouri, for instance, now and then, cold-blast charcoal is made. I may mention, by the way, that the gas from the Newark spiegeleisen furnaces, being mixed with considerable zinc fumes, must pass over water, through a chamber divided into compartments, before it enters the blast re-heating ovens. The oxide of zinc, as condensed and deposited in this chamber, possesses a grey-greenish color, and is afterwards reduced to spelter.

The pumps, supplying the water for cooling the tuyers, represent a good many of the manufacturers, whose pumps are illustrated in the advertising columns of the ENGINEERING AND MINING JOURNAL. My attention was particularly attracted by a water-pump at Anderren, built by Mr. H. R. WORTHINGTON, 61 Beekman street, New York, on account of its simple construction, its gentle, steady movement, and a peculiar circumstance connected with it. It lifts the water to the tuyers, about thirty feet high, from a pond which, being separated from the Delaware River by an embankment of cinders only, rises and falls with the river. The engine is placed at the side of an older water-pump at the bottom of a tower-like building. It consists of two steam cylinders, the piston-rod from each of them directly pulling and pushing the piston of a double-acting water-pump. By a very simple arrangement of knee-levers, each of the steam-engines regulates the valve-action of the other without the help of any fly-wheel. All water-ports are as wide as possible. The steam is conducted to the engine, a distance of some hundred yards through a pipe of about two inches diameter, from the common boilers. When, last year, the Delaware river suddenly rose to a height of about twenty feet over this water-pump (the high water line may yet be observed in the pump engine-house)—it continued to run under water for three days. More steam than usual was consumed, but the pressure of steam remained the same as before, viz.: about forty-five pounds in the boilers, and the water condensed in the steam-pipe and in the engines was thrown out through the exhaust-pipe which overtopped the high water-level.

As I have incidentally mentioned, the Delaware water at this place is filtrated through an embankment of cinders before it reaches the water-pump. Also, the clayish water of the Mississippi River, with which at the Kingsland furnaces the boilers are fed and the tuyers cooled, must be filtered before use. At Irondale, the water, containing much bi-carbonate of lime is re-heated before use. Simple carbonate of lime is deposited in the re-heating pans as a white, soft spongy material.

The Stonebreakers used at some few establishments are of Mr. BLAKE'S invention, and of similar construction to the model, exhibited at the London Exposition of 1862. In Europe, the construction of these breakers has since that time undergone many variations.

Results Obtained at the Blast-Furnaces Visited.—Some of the following figures have already appeared in this and preceding letters, and are here recapitulated only for giving as complete portraits of the blast-furnace process at different establishments, as the few observations made during our brief visits will allow. Most of the data put together in the following summaries, not being taken from the books, but verbally communicated by superintendents, furnace-masters, etc., must be considered as only approximating the truth. Notices received at some establishments were so incomplete, or seemed so improbable, that I thought it best not to attempt to tabulate them. Of the following table, it may be remarked, that the two last columns contain results calculated from the figures in the preceding columns, and not directly communicated to me. The average yield, as stated in the seventeenth column, refers to ore and cinders, or scraps, put on the furnaces. A ton is calculated at 2268 lbs. In the fifth column the number of tuyers actually used, and that of existing tuyers, is specified, the latter by figures in parenthesis.

Name of Establishment.	Number of Furnace.	Dimensions. Height.	Bosh.	Tuyeres. No.	Tuyeres. Diameter.	Blast. Pressure lb. per square inch.	Blast. Temperature. Fahr.	Charges composed of: Ore—Kind of.	Lbs.	Limestone. Lbs.	Fuel—Kind of.	Lbs.	Number charges in 24 hours.	No.	Fig Iron produced. Tons.	Average percentage of Ore, Cinders, Scrap.	Fuel consumed to one ton Pig Iron.	Castings in 24 Hours.	Remarks.
Anderron	3 and 2	55′	18′	3 and 5	4″	3 à 3½	500 à 800	Mag.	2500	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	1	42′	18′	3	4″	3 à 3½	500 à 800	Rockaway	1400	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Dover	700	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Allen	700	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Scrap	700	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Total	5800	1500	Anthracite	4480	20 à 32 in average 24	.....	.....	.....	.....	.....	
Bethlehem.	2	45½′	15′	6 (8)	3″	5	400 à 500	New Jersey magnetite	700	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Brown hematite (washed)	2250	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Total	2950	1800	Anthracite	2464	51	.....	.....	.....	.....	.....	
	1	50′	18′	5 (7)	3″	5	400 à 500	Rolling mill, etc., cinders	250	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Lebannon magnetite	1100	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Hematite	?	.....	.....	.....	.....	.....	.....	.....	.....	.....	
								Total (?)	1350	250	Anthracite	2000	52	.....	.....	.....	.....	.....	
Pilot Knob.		45′	11′	3	3″	2¼	600	Burnt specular Pilot Knob ore	640	110	Charcoal (22 bushels)	440	110 à 115, av. 112	3	16½	52.2	1.32	68 (?)	2.13
Iron Mountain	2	37′	9′	2	3′	3½	500	Burnt Iron Mountain magnetite	700	60	Charcoal (20 bushels)	400	av. 120	4	21	55.7	1.01	56.7	0.94
								ditto	750	60	ditto	400	av. 131	4	24½	56.7	0.94	59.9	1.71
Kingsland.	1 and 2	60′	14′	11	3″	4¾ à 4½	550	Burnt magnetite from Iron Mount.	3000	.....	Coke	1000	20 à 36	.....	.....	.....	.....	.....	.....
								Rolling mill, etc., cinders	100	.....	Illinois Coal	2700	av. 33	.....	.....	.....	.....	.....	.....
								Total	3100	900	Total	3700		.....	.....	.....	.....	.....	.....

Grey foundry, No. 1; neutral iron of high qualities and a very good furnace run were obtained when 3% Iron Mountain and 1% hematites were used. Cinder very basic, of light grey color and earthy fracture. Lime-powder conducted from out the furnace-gases. Some of the figures here communicated according to the furnace-masters' statements are perhaps not quite exact. The average percentage of the ore was stated to be 60 per cent., according to other authority 65 per cent.

Grey mottled pig iron for rails; cold-short. Cinder of pearl-grey color and stony fracture. In tuttles are found white crystals of diopside. Campaigns of five years.

Grey forge pig iron for tops of rails. Grey cinders of stony fracture.

Grey forge pig iron for crop of rails. The bad influence of the phosphorus in the cinders and the sulphur in the Lebannon ore seem to neutralize one another to a certain degree. The week before my visit 215 tons pig iron were made in this furnace.

Grey forge pig iron for steel and nails. Cinders of vitreous and enamel fracture; swel to white sponges when running over wet sand. Campaigns 5 à 7 months.

Grey forge. No. 2; considered to be a little red-short. Cinder of pearl-grey color and stony fracture, yet spongy when poured with water; 112 à 120 bushels of coal are generally assumed to make one ton of pig.

* Nozzle.

NOTE.—I have inadvertently, in several places, called the Iron Mountain ore Magnetite. It is more properly *Martite*—a mineral which combines some of the physical qualities of magnetite with others (for instance, the red powder) of hematite. From the analysis by Mr. DORNBACH, given in a former letter, it appears that this ore is composed of $27Fe_2O^3,19\ FeO$; or, approximately, $3Fe_2O_3, FeO$, while the composition of magnetite is Fe_2O_3, FeO. Consequently, it contains one more equivalent of peroxide of iron than the veritable magnetite. It may be added, that the Iron Mountain ore is generally considered to make red-short iron, especially the "block ore."

According to statements kindly communicated by Mr. THOMAS, the weekly produce of one of the four Hokendauqua furnaces is two hundred and seventy to three hundred and fifty tons. Of course the daily produce must be (in average) 44.3 tons. One hundred and fourteen charges are made daily; and a charge composed of three-fourths hematites and one-fourth magnetites, returns 42 to 43 per cent. of pig iron. Consequently about 104.2 tons of ore, viz: 26 tons magnetites and 78.2 tons hematites are charged daily. The lime used amounts to two-thirds of the ores, or 69.5 tons daily. It is said that 1.16 tons of anthracite are consumed for one ton of pig; 51.4 tons of anthracite would therefore be the daily charge of a furnace. But this figure being remarkably low, I fear I have mistaken, understanding 1.16 instead of 1.60. Each charge (fuel deducted) must therefore be composed of about 518 lbs. magnetite, 1,555 lbs. hematite, and 1,382 lbs. lime. Grey iron was made. Cinder grey, of stony fracture. Pressure of blast six pounds; temperature 1100°; 7 tuyers. Three furnaces, 55 feet high; one 60 feet; bosh 18 feet.

At Lockridge, another recent and remarkable establishment of the THOMAS Company, the superintendent, Mr. WEBER, stated the charges to be composed of one-fourth magnetite, three-fourths hematite, and two-thirds (of the weight of ore) time, and to require 1.14 a 1.18 tons of anthracite (1.40 a 1.80?) to one ton grey foundry. Pressure of blast 6½ lbs., temperature about 1100°.

SCHONBERGER, BLAIR & Co.'s two furnaces at Pittsburgh made together, per week (in average) 500 tons of mottled and grey iron with 79 bushels of coke per ton, or about 0.9 to 1 pig iron. The ore-charges, chiefly composed of Missouri and Lake Superior ores, a little rolling-mill cinders and hematites of 40 a 45 per cent., were said to yield about 69 per cent., which seems almost impossible. Lime in the proportion of one-third to the weight of ore was used. The furnaces are forty-five feet high, thirteen feet wide in the bosh. The blast is introduced through three and five tuyers, under a pressure of three pounds, and with a temperature of 1100°. A part of the pig-iron is directly puddled, and rolled out to sheets for the fabrication of nails; another part is submitted to the Ellershausen process, puddled and rolled to mock-bars for the fabrication of horse-shoes.

TO BE CONTINUED.

American Tea—The Japanese Colony in California.

THE fact that the tea plant is being successfully grown in California has awakened a great degree of interest in every part of the United States and in Europe. More especially are the residents of the Southern States interested in the little Japanese colony in Eldorado county, California, which, although insignificant in itself, is working out a problem involving perhaps the addition of millions of dollars to our national wealth. A correspondent of the San Francisco *Morning Call*, gives the following account of the colony, and the progress already made in successfully cultivating the tea plant, which will undoubtedly prove very interesting to many of our readers. He says: "Gold Hill, El Dorado county, formerly one of the richest mining regions of the State, is now comparatively deserted, and its mines mostly abandoned. But Gold Hill bids fair to enter upon a new era of prosperity, not with the rush that first characterized her coming into public prominence, but by the slow and sure process that agriculture insures when the proper opportunities are offered. Gold Hill appears to be a valley, to one coming from the high mountains in that region, because of its low situation topographically; but the country is rolling, and gives evidence of the foundation for great agricultural wealth. Where the land is not torn up, and stripped of its surface by miners, vines and fruit trees are planted, gardens are cultivated, and the scene resembles those peculiar to localities known as 'cow counties.' But cow counties are not to be despised, and the day has gone by when the proud and aristocratic mining counties could look down upon them with contempt. Agriculture has grown to be a giant, while mining has wasted its best energies, and stands old and decrepit in the presence of its youthful and vigorous competitor. None appreciate this wonderful change more than the miners, and they are filled with sadness at the thought that the days of lucky strikes and big nuggets are nearly at an end. They feel it also in their pockets—those whose pockets are not empty, and hence devoid of sensitiveness—and many of them are trying to struggle out of the current in which they have so long been drifting to no purpose, and fall into the agricultural tide, which they believe to be that 'tide in the affairs of man, which, if taken at the flood, leads on to fortune.' With this object in view they have settled upon large tracts of land, and in their spare hours, when the elements and other causes prevent mining operations, they devote themselves to clearing off their land, planting vines, and at least preparing a home and a place to lay their heads. Many vineyards, and orchards, and gardens are growing up in this vicinity, which promise to be not only attractive on account of their home-like qualities to their owners, but exceedingly profitable as well.

"THE JAPANESE COLONY.

"The arrival and settlement of this locality by HERR SCHNELL and his Japanese, commonly known as the Japanese Colony, has given a new impetus to agricultural and vinicultural pursuits. They had never before appreciated the value of the land, or been aware of its adaptability to many purposes to which it is now being put; but the knowledge and experience of HERR SCHNELL has convinced them that their soil is of great value, and with proper cultivation will yield handsome returns. And here let me correct an erroneous impression that has gained general credence, that is, that the Japanese have come here of their own accord, to settle and establish a community, and that HERR SCHNELL is their agent. Such is not the case. The enterprise is a private speculation of Mr. SCHNELL. He has purchased the land, cultivates it upon his 'own hook,' and simply hires the Japanese, paying them regular monthly wages, under contracts made in Japan, and the honors and profits, as well as the drawbacks, are SCHNELL'S alone. He has now twenty-one Japanese in his employ, comprising seven women and fourteen men. This number will be amply sufficient for all the land he can successfully cultivate for some time, and he will only send for more as he may require them. The success of his enterprise will not bring any Japanese here of their own accord, except such as he may desire to hire for wages, or unless others, taking advantage of his success, conclude to embark in the same business, so that all hopes or fears of a large Japanese immigration to spring from this experiment may as well be at once dismissed.

"At Gold Hill I met with the Hon. HUGH NEWELL, Assemblyman from El Dorado county, who resides here, and with Messrs. NEWELL and GILDEA visited Mr. SCHNELL'S plantation, where we were hospitably received, and shown over the premises—the proprietor taking special pains to enlighten us upon his plans, and more particularly upon the culture of the tea-plant, which he has successfully inaugurated.

"TEA CULTURE.

"Here I saw, for the first time in my life, the tea-plant in growth. From the experiments thus far made, Mr. SCHNELL is convinced that the problem of tea culture in California is solved, and there is no longer doubt but we can raise as good teas here as are produced in China and Japan. The few plants which I saw were only an experimental crop, planted in July, when the ground was dry, hard, and parched, raised under the most disadvantageous circumstances, in one of the driest seasons ever known, but show all the signs of a healthy and and vigorous condition. Mr. SCHNELL informs me that only one variety or kind of tea is known, and is the one designated by Dr. VON SIEBOLD as the *simensis Linn.* All of the varieties described by botanists under the names bohea, viridis, laden, stricta, etc., are only variations of the *simensis Linn.*, produced by different modes of cultivation and geographical distribution. Dr. VON SIEBOLD places the *simensis* under the *monadelphia polyandria Linn.*, and to the natural family of the *camelliarum decam.* The tea shrub in Japan is an evergreen, from four to six feet high, with a straight stem, and numerous irregular branches. Growing wild, the shrub will reach a height of fifteen or twenty feet. The stem is of a bright gray color, the branches chestnut, and the wood hard, and having a peculiar odor. On the young branches are the short, soft, green, small leaves, which are arranged at intervals, and are of an elliptical shape, with teeth on the borders, resembling closely the leaves of the wild rose. The color is a bright green, of different shades, deepening as the season advances. Between the leaves sprout the blossoms, which are at first of a rose color, but in the course of their development assume lighter shades, and finally, when full blown, are of the color of the ordinary tea rose. They have no odor, and are very tender, but are put to no use. The story that these flowers are preserved for mixing teas that are only drank by the Emperor and the nobility, is a fabrication. When these flowers fade away, they leave a small fruit, which is divided into two or three partitions, generally three, which contain the seeds. Owing to the great quantity of oil contained in these seeds, they are difficult of preservation, and easily decay.

"The tea shrub is very easy of cultivation, and will grow nearly everywhere, with plenty of air and sun, but cannot live in shady places. All of the new plants at Mr. SCHNELL'S plantations are raised from seeds, which are planted in rows in furrows, from four to six inches deep, in a manner similar to that in which beans are usually planted; but out of this number of seeds, probably but one or two in each hill will sprout, owing to the decay produced by the excessive quantity of oil they contain. The proper time for tea planting is in November or December, when it sprouts through the ground in about thirty days. By the ensuing May, the plant reaches a height of about fourteen inches, when the perfect and tender leaves are stripped off, and are placed under immediate manipulation. They are first put in a large copper pan and roasted, then put in baskets and shaken and swung in the wind until they are dried of the moisture that has been exuded by the heat, then roasted again, then rolled in the palms of the hand to separate the leaves, and prevent their crumbling into powder, then dried again in the baskets by shaking and swinging, and then put in jars, when they are ready for market. The black teas are roasted three times, the green teas but once or twice. Every year the trees or shrubs are trimmed down to a height of about three feet, after having reached that height, and when properly taken care of, will produce good crops for upward of thirty years. It is absolutely necessary that the plants should have the morning sun, and be on the south side of a hill, or the leaves will become yellow, and the tea be of an inferior quality. Mr. SCHNELL has about one hundred and twenty acres of good agricultural land ready for planting, and about four hundred acres of rough land, which he proposes to clear as soon as he can bring it into requisition. His plants will require no irrigation, but he is digging a well upon his place for other purposes."

Placer Mining Law.

THE following bill was introduced a few weeks ago in the House of Representatives, by Mr. SARGENT, of California:

"AN ACT to amend 'an Act granting the right of way to Ditch and Canal owners over the Public Lands, and for other purposes.'

"Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the Act granting the right of way to ditch and canal owners over the public lands, and for other purposes, approved July 26, 1866, be and the same is hereby amended by adding thereto the following sections, numbered 12, 13, 14, and 15, respectively, which shall hereafter constitute and form a part of the aforesaid Act:

"SEC. 12. And be it further enacted, That claims usually

called "placers," including all forms of deposit, excepting veins of quartz or other rock in place, shall be subject to entry and patent under this Act, under like circumstances and conditions and upon similar proceedings as are provided for vein or lode claims; provided, that when the lands shall have been previously surveyed by the United States, the entry, in its extended limits, shall conform to the legal subdivisions of the public lands, no further survey in each case being required, and the lands may be paid for at the rate of $2 50 per acre; provided, further, that legal subdivisions of forty acres may be subdivided into ten acre tracts; and that two or more persons, or associations, having contiguous claims, may make joint entry thereof; and provided, further, that no location of a placer claim hereafter made shall exceed one hundred and sixty acres for any one person or association of persons; and nothing in this section contained shall defeat or impair any *bona fide* pre-emption or homestead claim, or authorize the sale of the improvements of any *bona fide* settler to any other purchaser.

"SEC. 13. And be it further enacted, That where said person or association, they and their grantors, shall have held and worked their said claims for a period equal to the time prescribed by the Statute of Limitations for mining claims of the State or Territory where the same may be situated, evidence of such possession and working of the claims for such period shall be sufficient to establish a right to a patent thereto under this Act, in the absence of any adverse claim.

"SEC. 14. And be it further enacted, That Registers and Receivers shall receive the same fees for services under this Act as are provided by law for like services under other Acts of Congress, and that effect shall be given to the foregoing Act according to such regulations as may be prescribed by the Commissioner of the General Land Office.

"SEC. 15. And be it further enacted, That so much of the Act of March 3, 1853, entitled an Act to provide for the survey of public lands in California, the granting of pre-emption rights and for other purposes, as provides that none other than township lines shall be surveyed where the lands are mineral, s hereby repealed."

Polytechnic Club of the American Institute.

Meeting held at rooms of the Association, January 27th, 1870, Professor S. D. TILLMAN in the Chair.

THE first subject for consideration was Tempering Steel.

Professor PHIN remarked that this was one of the most important processes of our arts. In large masses and irregular shapes, the tempering of steel presented unusual difficulties not found in the manipulation of smaller ones of regular forms. There are certain peculiar points in the operations of tempering and hardening, of which the speaker made particular note, and which, he said, had been overlooked by most, if not all, who had paid attention to the subject. Certain waters have a peculiar and fine influence upon steel. Some shops have had a great reputation, not on account of being situated near particular kinds of ore, but because located near waters of a peculiar character. Tempering consists of two processes: first, hardening, and then, second, annealing. The latter is easy, compared with the former; boiling water will, to some extent, reduce the hardness of a piece of steel. Hardening, then, is the chief point upon which the attention must be directed. Steel must be cooled equally and suddenly. So, if a piece is large, of irregular shape and various thicknesses, it will be unequally hardened and at the same time warped. Much of this difficulty is done away by making the steel of such shape that it will be more equally affected.

What is it, then, that confers upon liquids the property of producing this cooling? The speaker thought that it depended upon the power of the liquid to take up and carry away the heat from the steel. A liquid, then, is to be sought that will bear away the heat most rapidly from the steel. Although the specific heat of mercury is less than that of water, still, on account of its greater density, [and the fact that it does not form a steam to prevent contact] the speaker thought it one of the best, or a good medium for hardening.

Water must come into most intimate contact with the heated metal, hence the superior value of "old water," or that which has been long used for tempering, because by the repeated plunging of hot metal into it, a large portion of the air it contained escapes. When perfectly free from air, water requires 100° more heat to cause it to boil than before. So, get a liquid that will boil at a high temperature, and you will have better tempering liquid. Mr. PERKINS' method of propelling a stream of water against the heated steel with great force, amounts to the same thing, producing by mechanical means the effect of a liquid with a high boiling point.

Some men can harden steel without warping, and others, taking perhaps the same blade, will be unable to do so. The secret is in the fact that in one case the article went directly into the water and was held still, while in the other an irregular motion cooled one side more rapidly than the other, and of course warped the blade.

Mr. WIARD proposed a theory that accounted, in his mind, for the hardening of steel in a satisfactory manner. It was this: As an article passes into the water, the particles of the metal are suddenly thrown into a state of tension, stratum contract upon stratum, or, in other words, the particles are braced against each other, so that the particles may be supposed to form a truss, extending, in effect, throughout the hardened mass. The gentleman then detailed an experiment with a sheet of steel as large and thick as a sheet of commercial note. When heated and cooled, with *perfect equality* in all parts, it did not show the least trace of hardness, yet, cooled in the ordinary way, was made so hard as to cut glass.

The plane irons for a Woodward planer were then spoken of as presenting unusual difficulties in the way of hardening without warping. It was perfectly easy, however, to harden them, if it was only done in the right manner. They were to be taken with the edge toward the hand, the bevel down, and plunged into the water at an angle downward from the person. As one part cools or contracts, or is "trussed," it bends the plate, while the next portion, as it cools, draws the plate back into shape.

The discussion then took a more general form.

Dr. VAN DER WEYDE had paid some attention to hardening for magnetic purposes, and thought that chemical properties in liquids had no effect upon the hardening of steel. He spoke of the case hardening of iron by the prussiate of potash, but said if the prussiate was in solution it would have no effect. It was replied that the chemicals were not supposed to have any further effect than to influence the cooling power of the water. The Damascus blades, so famous for their remarkable properties, were only made at certain times, when the north wind blew. They were tempered by holding them edgewise before a long, narrow slit, through which the wind was allowed to blow, and so cool them.

Quite a discussion then took place upon various points relative to the hardening and tempering of steel, and the effects of various compounds. Several theories were propounded.

Mr. AMORY then stated some facts in regard to the effects of different liquids, and the rapidity with which they cooled the steel. Water, with a certain proportion of sulphuric acid and some other ingredients in varying quantities, would cool the steel to just the right degree of hardness, rendering tempering afterwards unnecessary. These substances could be so varied in quantity that any degree of hardness could be obtained. The invention has been patented, and is now used by many large companies—the Erie Railroad, among others, was mentioned. A large saving in springs was made by it, as the steel was more elastic.

The next subject on the programme was then taken up by

Mr. BOYLE. Dr. HALL, at a previous meeting, took the ground that the mirage belonged only to catoptrics—i. e., belonged to the subject of reflection. An illustration of the double images of the mirage was then given. A miniature vessel was placed upon the surface of a horizontal mirror, and a white screen, representing the sky, then held beyond it, when the gas light was held in a proper position on the opposite side of the mirror, the double shadow of the vessel was seen on the screen, the one erect and the other inverted. It was then contended that the mirage was in all cases a reflection and not a refraction, and that when seen in the air some cloud or vapor was present, to serve as a screen upon which it could be made visible. Various instances were cited and explained upon this hypoth esis. It was then suggested that in some cases the mirage might be produced by reflection from the lower surface of a stratum of air. The discussion then became general, and various facts and explanations were brought forward upon both the reflection and refraction theory. The phenomenon of "looming up," as it is called along this coast, was mentioned, but hardly received a satisfactory explanation from either side. The discussions, though long and rather exciting, were very good-natured and exceedingly interesting.

MINING REVIEW FOR 1869.

[From the San Francisco Commercial Herald.]

TOTAL PRODUCT OF BULLION IN CALIFORNIA.—DIMINUTION THE PAST YEAR.

Twenty-two years ago this month gold in large quantities was first discovered in California, since which time nearly one billion dollars' worth of this metal has been extracted from the mines in this State, being an average of about forty-five million dollars per annum. The first year $10,000,000 were gathered; the second, $40,000,000, which amount gradually increased till 1853, when $65,000,000, the maximum amount collected in any one year, was reached; and from which time the yearly product steadily declined till 1869, when but about $23,000,000 were taken out, being the minimum annual yield since the opening of the mines. These estimates do not include the gold and silver bullion extracted in the other Pacific States and Territories, amounting in the aggregate to $250,000,000. The yield of the precious metals has been gradually decreasing in these countries for the past two or three years as well as in California, the most marked declension having occurred during the year just closed. It is believed by those best informed that the falling off in the bullion product for 1869, as compared with the preceding year, has been not less than six or eight millions of dollars for the entire Pacific coast—some estimating it at a couple of millions more.

That the reduced yield of the precious metals above set forth has been due to special and temporary causes is, we think, susceptible of easy demonstration. Owing to the heavy emigration to eastern Nevada and elsewhere, there have been fewer men at work in the California mines the past year than usual. There has also been a great scarcity of water, both here and elsewhere, for placer operations, while certain disasters to the Washoe mines served to diminish their production materially. But notwithstanding this falling off in the yield of our productive mines, the past year has been one of nearly average prosperity to individual miners and companies, owing to the lessened cost of living, and the greater economy effected in the extraction and reduction of ores. It has also been a year of great activity among prospectors, a larger extent of mineral country having been explored than ever before. In the course of these explorations, which have been carried on in every direction, many valuable discoveries have been made, more especially in Northern and Eastern Nevada, and other portions of the great Utah Basin. During the past twelve months various remote sections of country have been penetrated, and many new districts organized, adding largely to the area of our ascertained metalliferous territory, now demonstrated to be co-extensive with our Occidental possessions. With the stagnation of trade and the general depression of other branches of business, there is even a better feeling beginning to obtain toward mining itself. With our manufacturing and mechanical pursuits struggling against a ruinous competition, and our agricultural staples vainly seeking a remunerative market, it is perceived that in mining we have a business that can never suffer from competitive strife, nor be left without a ready market for its products. Prosperous as the husbandman and herder have been, and richly as the artisan has been rewarded for his labors the past few years, it is becoming obvious to all that mining is to continue, if not the foremost, at least one of the great sustaining industries of the country. * * *

SOUTHERN SECTION OF THE GREAT GOLD-BEARING BELT, INCLUDING KERN, TULARE, FRESNO AND MARIPOSA COUNTIES.

The business of mining in all its departments has been considerably curtailed the past year in this entire group of counties, the marked decline which set in over three years since having been hastened by the departure of many miners for the White Pine country one year ago. The most extensive vein mining in Kern county has been carried on in the vicinity of Havilah, Sageland and Kernville, at each of which places a number of mills, some of them of large capacity, have been erected within the past four or five years. In each of these localities the quartz veins are numerous, of fair dimensions, and not deficient in the precious metal, which in the upper portion of the veins being free, insured profitable workings for the most of the mills at first. Upon reaching the water level, however, the ores becoming highly sulphuretted and intractable under the simple processes in use, nearly all the mills have stopped running, awaiting a freer application of capital to the development of the mines, and the introduction of a more efficient mode of treating the ores. * * *

During the past year a number of mills have been running in this county with fair success, and there is a prospect that several that have for some time been idle will soon start up. Besides its gold mines, Kern county contains other mineral deposits of value. On the plain near Kern river are saline springs, from which a good article of table salt has been made. There are also in this section of the county a number of sulphur beds that will no doubt one day be worked with profit. Petroleum springs and beds of asphaltum are found over a large area near Buena Vista Lake. One of these springs covers nearly an acre, being surrounded by a reef of hardened maltha or asphaltum. Works were put up here some six years ago with a view of distilling oil from this crude material, and although several thousand gallons of a very superior article were produced, the cost of transportation to a market was too great to leave any margin for profit. With railroad carriage to San Francisco, a lucrative business might be found in the manufacture of oil at this place.

While some limited surface diggings have been found at two or three localities in Tulare, a considerable number of small but rich quartz veins have been successfully worked near White river and Tail Hold, where several small mills have been running for six or eight years.

So little mining has been done of late years in Fresno, that it scarcely deserves a place in the list of mining counties. Surface workings were carried on here to a considerable extent in the early day; but now very little is done in this line, except the rewashing of a few bars on the San Joaquin, and occasionally a little work performed in the old diggings elsewhere in the county during extremely wet seasons. Although no auriferous veins of quartz have been found here, the county abounds in rich deposits of copper, upon which a good deal of work in the aggregate has been done, though not a sufficiency has been applied at any one point to fully establish their value. Some of these veins have been opened to the depth of a hundred feet or more, exhibiting at that depth satisfactory evidences of permanency and wealth. Some of these lodes are well defined and capable of being traced a distance of several miles. A few years since a quantity of this ore was sent to San Francisco at a cost of transportation of $80 per ton, leaving still a small margin for profit to the shipper. With a railroad passing in the vicinity, the value of these mines could not fail to largely appreciate. * * *

During the past summer several quartz mills have been put up in Mariposa county, all of which have since commenced successful operations. The Mariposa Company, present owners of the Fremont Grant, have also made important alterations and improvements in some of their extensive mills, all of which have been kept running with profitable results on ore from their own mines. This company are about erecting an additional 60-stamp mill on the Merced river, near the site of the old Benton mill, the dam of which was destroyed several years since by a freshet. The principal and most largely-developed mines of this company are the Pine Tree, Josephine, Princeton, Mariposa, Green Gulch, the Missouri and the Mount Ophir. The mills owned by them consist of the Benton, 64 stamps; the Mariposa and the Mount Ophir, each 28 stamps; the Princeton, 24 stamps, and the Bear Valley, 12 stamps. After running with variable success for some time, these mills all suspended operations, remaining idle until the middle of the year 1867, when the most of them were again started up, and since which time they have, under a more frugal and careful administration, been running with satisfactory results.

TUOLUMNE, CALAVERAS AND AMADOR COUNTIES.

This tier of counties, lying centrally along the great metalliferous zone that stretches for four hundred miles across the foot-hills of the Sierra, was from the earliest periods of gold-mining distinguished for its prolific yield of the precious metal. * * * After gradually declining for ten or twelve years, placer-mining, with the introduction of water into new localities, the opening of the ancient river channels, cement mines and gravel beds, has for several years past been gradually growing more active in this cluster of counties. In Tuolumne and Calaveras, ranging either side of the Stanislaus river, occur those singular basaltic formations having perpendicular sides, and, from the flatness of their tops, called "Table Mountains." Buried deep beneath these masses are rich deposits of washed gold, demonstrating that they occupy the channels of former rivers. These subterranean gold fields are now extensively wrought by means of costly tunnels, constituting a permanent—though as yet they have not, owing to imperfect modes of working them, proved a profitable—class of mining. That they will do so, however, with the greater experience now obtained, seems probable. At first many mistakes were made as to the exact level of these ancient river beds, in consequence of which some of the tunnels were run too high and others too low, necessitating in the former case a resort to pumping, and in the latter the cutting perhaps of a new tunnel. The most of these difficulties, as well as others incident to this class of operations, the miners are now able to obviate, rendering success more uniform and certain. About $3,000,000, it is estimated, have been extracted from these Table Mountain claims, not a tithe or even perhaps a hundredth part of the treasure that still remains locked up in their dark and unexplored chambers.

What is known as the Mother Lode, the *Veta Madre* of the Spaniards, passes across the western portion of these several counties. It is a broad ore channel, carrying in places several parallel veins, and is known to extend from Mariposa county north for a distance of more than a hundred miles. The rich claims of the Mariposa Company, as well as a large number of others further north, are all upon this vein. Among the more prominent quartz mines of Tuolumne county we have the Golden Rule, the Reist and the Healep—all for a number of years steady, and, at times, largely paying claims—the Soulsby, eight miles east of Sonora, for some time one of the most productive and profitable mines in the State; and although suffered to lie nearly idle for a number of years, is still considered, by every expert who has examined it, a most valuable property. This mine was discovered in 1858, and is said to have

turned out $500,000 during the subsequent three years, a large percentage of which was profits. Attached to the mine is a 20-stamp mill, driven by water, when that can be obtained, and by steam power during the dry season. This entire property is now owned by parties in San Francisco, who are not working either the mill or the mine up to anything like its full capacity. Indeed it may be said to be in a state of suspended animation, from which it might at any time be resuscitated under the use of more vigorous measures. The App, the Golden Rule, Raw Hide, Patterson, Grizzly, Snell, Draper, and the Silver or Anthrax, are all mines of value, having mills upon them which have been run for many years: always with fair, and in some instances with very marked success. The App mine, near Jamestown, has, with a 10-stamp water-mill, turned out for a long time from 1,500 to 2,000 tons of ore per year, yielding at the average rate of $15 per ton, the cost of raising the ore having been about $8, and of crushing and amalgamating, $4 50 per ton. The Anthrax mine, adjacent to the App, and consisting of 1,500 feet on the Mother Vein, and supplied with a 10-stamp mill, awaits more thorough exploration. It is a property that would generously respond to the judicious application of liberal means directed to its more complete development, the great predominating lode of the country being at this point highly fertile and of masterly proportions. There are many other quartz mines of less note in this county, the most of them furnished with mills varying in capacity from five to twenty stamps, about one-third of which are now idle.

Among the more extensively developed quartz mines of Calaveras county, some of which have, at times, proved extremely prolific, are the Morgan, Stanislaus, Reserve, Enterprise, Union, South Carolina, Carson Creek, Angel's, Sickles, Woodhouse, Hill, and Bovee; while in Amador, the smallest, but one of the most successful quartz mining counties in the State, we have the Hayward or Amador, Marlette, Oneida, Coney, Lincoln, Keystone, Bunker Hill, Seaton, Spring Hill, Plymouth, Union, Paugh, Enterprise, Hinckley, Sirocco, Tellurium, Anaconda, Thoss, Golden Eagle, and the Belden. In connection with each of these claims, one or more mills have been erected, the most of which have been operated with success. On the Kennedy claim the Casco lode improves with depth, and is turning out good ore. Powerful and complete hoisting works have lately been put up on the Lincoln mine, owned by Governor Stanford and others, and lying a little north of the Hayward mine, near Sutter creek. These works operate satisfactorily, and the mine is looking remarkably well. The famous Hayward mine, after being worked for sixteen years—at first with but indifferent, and latterly with great success—having produced a total of about $8,000,000, is still yielding immensely, the net profits for the past year having exceeded half a million dollars. There are, however, in this, as well as in the adjacent counties, many quartz lodes that have failed to prove remunerative, and a number of mills are standing idle.

Placer mining in these counties, as elsewhere in the State, is now mostly confined to tunneling operations and hydraulic washings. There are deep beds of auriferous gravel in many places, but they do not pay for washing, as a general thing. There also remains here a considerable area of shallow placers, that would well reward the labor of working, could water be got upon them. Efforts are now being made to supply water to some of these localities, a few of which have been attended with success. Ditches having been completed, bringing water into Chinese Camp, Cat Camp, and upon Big Oak Flat, at all of which places there is still a great deal of paying surface dirt, mining is carried on there with more animation than for many years past. Rich strikes are now frequently heard of in these diggings, and many of the claim-owners are doing well.

Most of the deep gravel claims, worked through shafts and tunnels, have paid moderately well, the occasional occurrence of a rich pocket, or large nugget, often bringing the owners' wages up to a high average. The old Union shaft, Calaveras county, having been recently relieved of water, much new gravel of a high grade has been taken out; it having been ascertained, also, that portions of that formerly worked will pay for re-washing.

EL DORADO AND PLACER COUNTIES.

In passing north from Amador into El Dorado county, we encounter a marked change in the geological formation of the country, the belt of limestone observable in the group of counties last treated of disappearing shortly after we enter El Dorado, and granite taking its place along the western border of the gold-bearing range, as the bed rock. In no part of the State were the earnings of the pioneer miners so large and steady as in these two counties. To-day there is scarcely any portion of the mines in which the earnings of this class are less. With the exhaustion of the rich bars along the several forks of the American river and their confluents, which ramify all parts of these two counties, mining here ceased, as a general thing, to be a profitable business; but few of the quartz veins having turned out as well as in most other sections of the mines. There is, however, a good deal of hydraulic mining going on in both El Dorado and Placer; Dutch Flat, in the latter county, being distinguished as one of the most active localities in this branch of mining in the State. The quantity of dust taken out has, however, greatly diminished for the past few years. Twelve years ago the shipments of gold from this point, being in part contributions from neighboring camps, ranged from $35,000 to $75,000 per month during the first six months of the year; now they do not average half that amount. Besides Dutch Flat, the other most active centres of hydraulic washing in these two counties are in the vicinity of Placerville, Iowa Hill, Wisconsin Hill, and Forest Hill, many of the claims in the vicinity of the latter having produced enormously. But here, too, the quantity of gold dust turned out has suffered a great decline, having averaged, ten years ago, $100,000 monthly, whereas it is not now more than one-third that amount. The sums extracted from a few of the leading claims in that vicinity have been as follows, viz: From the Dardanelles, $2,000,000; from the Jenny Lind, $1,100,000; from the New Jersey, $850,000; from the Deidesheimer, $650,000, and from the Independence, $450,000, various other claims having yielded in sums ranging from $100,000 to $400,000; it being estimated that not less than $12,000,000 have been washed from the hydraulic claims immediately about Forest Hill, besides large sums extracted from the cement, by means of crushing in the mills used for that purpose. It happens in many cases that after washing off the softer and looser earth and gravel by means of hydraulic washing, that a cement is encountered in these claims, which, though rich in gold, is too hard or tenacious to be disposed of by this mode of treatment. For working this cement stamp mills are necessary, it requiring to be pulverized the same as quartz, after which the gold is separated from the refuse by washing. The number of mills engaged in this business is very numerous about Forest Hill, though generally they are not doing as well now as they were a few years ago. In order to reach this cement at points where it has not been denuded by hydraulic washing, many long and expensive tunnels have been run, the majority of which have resulted favorably. Although many improvements have been made in the methods and machinery used for working this cement, a process thoroughly adapted to its successful treatment remains a desideratum, the chief point of difficulty being to effectually separate the auriferous cement from the stones and bowlders with which it is intermixed, and to which it firmly adheres, without being forced to pulverize them.

Notwithstanding quartz mining has, in many instances, failed to pay, a number of new mills have been erected the past year in those counties. Many quartz lodes have also been located, and considerable work done, indicating a general revival of confidence in this branch of mining. A quartz claim, lately opened on Mound creek, near Placerville, is said to exhibit almost conclusive evidences of great wealth, the entire vein having a thickness of nearly two feet, indicating a yield of at least $30 per ton, the ore being soft and easily crushed. Some very satisfactory results have also been obtained from the mills already running. Thirteen tons of ore from the Evening Star mine, on Rock creek, milled $3,338—$256 per ton. There are also surface mines in this Rock creek district which have been for a long time and are still paying well. A crushing, lately made of eighteen tons of ore from the Rising Sun mine, near Colfax, taken from the lower level, yielded $1,431, being at the rate of nearly $80 per ton. From a pocket in the Oak Swamp ledge, forty-seven ounces of gold were taken in two days. Considerable quantities of ore taken from a claim near Newcastle, has paid at the rate of $36 per ton. A large lot of ore from the Evening Star mine, Placer county, has yielded $40 per ton. In El Dorado county the Crystal Company take out from sixty to eighty ounces of gold every week with an 8-stamp mill. The Stillwagon mine has made its owners rich, working with a 5-stamp mill. The Independence mine pays from $25 to $40 per ton, in free gold, besides a large percentage of sulphurates that may assay from $90 to $400 per ton. A trench four thousand feet long and from eighteen to thirty feet deep, is being cut near Placerville, to open up several hydraulic claims that have heretofore paid largely, but require additional fall for drainage, in order to their further working.

NEVADA, SIERRA, YUBA, BUTTE AND PLUMAS COUNTIES.

Though occupying scarcely one-quarter the area, this group of counties produces far more than all the balance of our California gold fields; a result due chiefly to the more productive and permanent character of the mines, but largely also to a greater amount of energy and thrift on the part of the inhabitants than has been displayed by the residents of other districts. These northern counties possess, too, the further advantage of greater accessibility and better natural water supplies than most other sections of the State; yet a large share of their prosperity and progress must be credited to their superior industry, enterprise and good management. Here the first wagon-roads and ditches were built and the first quartz mills erected. Here nearly all the valuable inventions and improvements introduced into mining originated—such as the tom, the sluice and the hydraulic mode of washing; the more marked success of the inhabitants of this region being almost as much the fruits of their greater ingenuity and energy as of its superior natural advantages. Owing to these causes, mining, while it has greatly diminished here, has not experienced such a notable decline as in the counties further south. Owing to a strike among the miners early in the season, about Grass Valley and Nevada, the product of the mines in that neighborhood was somewhat reduced, the ordinary yield of the placers having also been considerably curtailed by a scarcity of water. The fall of snow upon the Sierra, where all the rivers in this section take their rise, having been less last winter than usual, there was, throughout the summer, a reduced supply of water; many of the ditches and reservoirs being, before the season was over, quite dry. This low stage of water, however, proved favorable to river-bed operations, in which branch of mining many have done well. With the suspension of washing, the miners generally employed themselves getting out gravel and putting their claims in good condition against the advent of the winter rains, which, not until quite recently, have been sufficiently abundant to set them to work. At the present time, though the water supply is not as full as could be desired, much activity prevails in placer mining, the prospect being that a fair winter's work will be done.

At Grass Valley operations have been resumed on the mines, where suspended—nearly all the leading claims at that place now being in full and successful operation. One or two are not running exactly full-handed, but this is not owing to any difficulties between the owners and the workmen. These have all been settled—at least, in so far that the laborers now employed are no longer molested or threatened, though having consented to the use of giant powder and the single hand-drill, when required. At present experiments are being made in several of these mines with rifle-powder, which some of the superintendents prefer to any other kind. In its use the single hand-drill can be employed to advantage. The Allison ranch mine, at this place, for several years one of the most productive and profitable in the State, but finally closed on account of dissensions among the owners, has lately been re-opened; and, having been relieved of water, ore is being once more extracted from it freely. At the time of shutting down there was no lack of good ore, and it appears that equally as good returns are now being obtained as in its palmiest days—some of the ores paying as high as $200 per ton. Two hundred tons broken out from the old backs, and ranked only as second grade, yielded $33 to the ton.

Selected at random, we give the results of recent workings of a few of the better class of mines in this region of country. In December last the Brush creek mill, Sierra county, cleaned up $27,500, at a cost for extraction and milling of $7,000. This company have a ledge six feet thick, the average yield of the ore being $42 50 per ton. The ore taken from the Pittsburgh mine, at Grass Valley, has yielded of late as high as $135 per ton—$98 being free gold. The Cariboo, a spur or feeder of the Allison Ranch lode, is turning out rock full of large flakes of gold, nothing richer having ever before been found in any portion of that mine. From the Empire mine, Grass Valley, more ore is now being extracted than the thirty-stamp mill of the company can crush, necessitating the employment of an additional mill. This ore is all of high grade, and promises to be permanent, the ledge being large and steadily increasing with the depth attained. The North Star, having been freed from water, is again in full tide of successful operation, yielding ores that mill from $30 to $50 per ton. The Ophir, also a Grass Valley mine, is turning out from $30 to $40 ore, at a depth of 300 feet. For the year ending September 30, the Eureka mine produced $572,600 from 20,638 tons of ore; average, $27 80 per ton. The chlorination works of the company reduced meantime 137 tons of sulphurets, obtaining therefrom $171 per ton—a total of $23,532. The net profits of the mine were about $30,000 per month the year through. In August a piece of gold weighing one hundred and six pounds was taken from a quartz vein near the Sierra Buttes, $50,000 having been extracted from the claim in a single day. About the same time, and not far from the same place, a company of Chinamen picked up a piece worth $1,800. The Sierra Buttes mine, one of the most largely productive and profitable in the State, and the Independence, near by, also an excellent property, both continue to yield as well as at any time since they were opened. In both these mines giant powder and single hand-drills have been used the past summer, whereby a saving of from ten to fifteen per cent. of former expenses has been effected. The Alaska mine, near Camptonville, Sierra county, running a five-stamp mill, and with very insufficient appliances for working the blanket-washings, paid dividends at the rate of about $10,000 per month during the summer. A little before the entire property could have been bought for a sum equivalent to a three-months' dividend. Besides the gold extracted, a good deal of gold remains in the sulphuretted ores that abound in most of these mines, and which are generally preserved for subsequent treatment.

The Meadow Lake district, situated in the eastern part of Nevada county, and high up in the Sierra, some years ago the locality of quite a mining excitement, and ever since regarded with hopeful solicitude by parties owning interests there, seems to have been finally abandoned; all processes tried for extracting the gold supposed to exist in the ore having failed. The town of Meadow Lake, consisting of a hundred houses or more, some of them large and costly, will be without an inhabitant this winter.

Some of the hydraulic operations in this section of country are conducted on a very extended scale, the products obtained being, as a general thing, correspondingly large. Attached to the American hydraulic claim for Sweetland are three mills—one used to crush cement, and the others to grind sand and gravel. The expenditures upon this claim have been enormous. In addition to the tunnel already completed, a new one, five thousand feet in length, is being run, at a cost of $60,000. In loosening the ground, preparatory to washing it down, from 300 to 400 kegs of powder have been exploded at a time; not long since a drift was run one hundred feet in length, with arms reaching from its end each way, in either extremity of which 500 kegs of powder were placed and fired at a single blast, shattering many thousand tons of earth. The average clean-up of this claim is $25,000 per month. The average clean-up of the Buckeye hydraulic claim is $12,000 per month.

In the gravel as well as in the quartz claims there is much of a favorable nature to record. In December last quite an extent of auriferous material of this kind was discovered two miles west of Grass Valley, and which, it was thought, would give profitable employment to a good many men. At Relief Hill, also, there are reported to be many claims, the opening up of which offer inducements to men of small means. Several parties are running tunnels in the neighborhood, in the hope of being able to reach pay-dirt before spring. In November good placer diggings were discovered on Wahponsee creek, Plumas county, several of the claims paying an ounce a day to the hand. A stretch of unworked, but very promising, ground exists at Birchville, which can be washed to advantage when the tunnel—now in 3,000 feet—is completed. The Evans & Stidger claim, at Buckeye Hill, turns out from $16,000 to $18,000 per month. About San Juan, surface mining is proving generally remunerative, the Chinamen working in the neighborhood depositing in the banks from two to five thousand dollars weekly. Johnson & Co., working seventy Chinamen on the north fork of Feather river, Butte county, and now operating for the fifth year at that point, are taking out large quantities of dust. Their flume, through which the water of the river is conducted in order to lay bare its bed, is nearly seven hundred feet long and thirty-five feet wide, constructed of lumber. Heath & Co., of Argentine, Yuba county, piping off a talcose slate existing in that locality, are making from $16 to $25 per day to the hand. A shaft sunk in this formation sixty feet reveals as good pay as at the top. Sawpit, Plumas county, has been a very lively camp all summer, the numerous tunnels yielding rich dirt, and the hydraulic claims having been put in order for winter. A gravel claim, at the head of Sleepy Hollow, owned by White, Coe and others, is reported to have paid, for a time, at the rate of $100 a day to the hand. The rich claims about Smartsville and Timbuctoo, from which so many millions of dollars have been taken, continued to yield with their accustomed liberality. The bottom gravel in the claim of Alpaugh and others, near Pike City, have yielded from fifty cents to two dollars per pan, many equally rich deposits having been met with elsewhere.

[*To be Continued.*]

California.

NEVADA COUNTY.—THE GREAT MINING PURCHASE.

The Nevada *Gazette*, December 26, says: "We have been shown a copy of the London *Mining Journal*, November 27th, giving the proceedings of a meeting of the Pacific Mining Company, limited. This is the company that has purchased the Union Hill quartz and Buckeye gravel mines in this county, and the proceedings contain a lengthy report of George Batters, the agent of the company. It appears that a mine at Austin (Buel North Star) is included in the purchase made by the company, and the amount paid for the three mines, as appears by the statement of a stockholder, was £135,000—the capital stock of the company being £150,000. The report of Mr. Batters is lucid and exhaustive; he gave a full history of gold mining in California and silver mining in Nevada—including a statement of the total yield since the mines were discovered, as well as the yield and profits of individual mines, such as the Comstock, Amador, Allison Ranch, Eureka, etc. It was demonstrated that the stockholders would make a profit of twenty per cent. per annum on the investment; and they unanimously passed a vote of thanks to Mr. Batters for affording them an opportunity of becoming interested in such a profitable enterprise. We hope the mines may prove as remunerative as the stockholders have been led to anticipate."

BUSINESS AND PERSONAL.

[*Short notices in this column fifty cents per line each insertion.*]

IRON AND STEEL MANUFACTURE.—CLAIM OF PATENT No. 97,897 in the manufacture of Iron and Steel, subjecting the mass of molten metal to the action of hydrogen gas alone, forced up through the mass in combination with a current or currents of atmospheric air or oxygen, introduced over the molten metal within a chamber of reflecting character, producing combustion of the carburretted hydrogen, phosphuretted hydrogen, &c., above the metal, substantially as and for the purpose specified. WILLIAM ENNIS, Patentee and owner of this process, wishes to call the attention of manufacturers to the above claim. WILLIAM ENNIS,
Jan11-1m Thirty-ninth street, north of Bridge street, Philadelphia.

GLYNN'S ANTI-INCRUSTATION FOR STEAM BOILERS.—The only reliable article for removing and preventing incrustation. No foaming, and does not attack metals of boilers. Liberal terms to agents. C. D. FREDRICKS,
Dec. 21, tf. 587 Broadway, New York.

MARKET REVIEW.

The Coal Trade.

NEW YORK, Jan. 28, 1870.

WHOLESALE.—There is little or no trade doing, and very few, if any, orders are coming in. The Scranton sale fully reported below has been the all-absorbing topic of conversation during the week. Since it took place, everybody in the trade has been canvassing its probable effect upon the future of the Coal Trade, and those who have the arranging of prices for the various other large coal corporations have been busy marking their prices in accordance with the new scale. These new prices will be found duly quoted in our columns this week. We published last week a circular of the Central Railroad of New Jersey, noticing a reduction in freights from Penn Haven via the Lehigh Valley Railroad and their road to Elizabethport. The following is circular No. 2, issued yesterday, making a further reduction of 32 cents, to take effect Jan. 31st:

OFFICE OF THE C. R. R. OF N. J.,
NEW YORK, Jan. 27, 1870.

NOTICE TO COAL SHIPPERS—NO. 2.

On and after Monday, January 31st, 1870, the tolls on coal from Penn Haven to Port Johnston will be as follows:

From Penn Haven to Phillipsburgh	$0 95
From Phillipsburg to Port Johnston	1 19
From Mauch Chunk to Philadelphia	0 81

R. E. RICKER, Supt. SAMUEL KNOX, Sec'y.

A correspondent writes us that on the 10th inst. the coal operators of the Broad Top Region made a reduction in the price paid for mining coal of 15 cents per ton, making the rate (per ton) 55 cents, instead of 70 cents; in consequence of which the miners made a general strike, yet in progress (Jan. 24th). Some two or three of the operators made a compromise with part of their men during the past week, however, at 60 cents, and are now at work; but as orders for coal are very slack at this season of the year, the others yet hold out for the full reduction.

The Ways and Means Committee decided yesterday to place Anthracite coal on the free list, and impose a tariff of $1 25 per ton upon other coal.

AUCTION SALE OF SCRANTON COAL.

The sale of 75,000 tons Scranton Coal announced in our last took place on Wednesday. The attendance was large, in consequence of the general interest felt by dealers, looking at the sale as the initial one of the year, and to a great extent foreshadowing the course of the trade for 1870. The bidding was done with little spirit, and no effort was made to influence buyers one way or the other. Whatever may have been the choice of those who pretend to shape the market, prices obtained show a decline on all sizes as compared with that of last month; also with that of the opening sale of last year. The sale opened with 7,000 tons of lump coal. The first lot of 100 tons brought $4 10, at which bid 1,000 tons were knocked down. The price was then gradually advanced to $4 15, but again fell to $4 10. It subsequently rose to $4 20, and the last lot sold at $4 15. Steamboat coal opened at $4 40, rose to $4 45, but fell to 4 37½, and again dropped down to $4 32½, at which price the bulk of it was taken. It touched $4 20, and closed at $4 25. The appearance of the market at this point was decidedly "flat," and grate opened at $4 25 (a heavy decline from the price obtained last month), at which rate a lot of 1,000 tons was taken. It then rallied, and sold up to $4 37½, and again to $4 40 and $4 42½. It then fell to $4 40, $4 35 and $4 30. Egg was sold at the opening at $4 40, a decline of $1 25 a ton below the price obtained last month. It then sold down to $4 32½, $4 25 and $4 20 in rapid succession. The next lot of 1,000 tons was sold at $4 15, and the balance brought $4 20 and $4 22½. Stove also started at a decline of $1 25 a ton, the first lot only bringing $5, which was the highest point reached. The price then receded to $4 80, but again advanced to $4 87½ and $4 90, at which prices it sold slowly. Ten thousand tons of chestnut coal closed the sale. The first bid was at $3 a ton, and this was run up until the first lot was knocked down at $4, a decline of 55 cents from last month. It then slowly sold down to $3 95, $3 92½, $3 90 and $3 87½. The last lot brought $3 95.

The following tables show the total amounts sold of each size and the highest and lowest prices obtained, compared with the sales for the same time last year:

1870.				Jan. 26.
7,000	tons	Lump	$4 17½ @	4 10
12,000	"	Steamboat	4 45 @	4 20
12,000	"	Grate	4 42½ @	4 30
10,000	"	Egg	4 40 @	4 20
24,000	"	Stove	5 00 @	4 80
10,000	"	Chestnut	4 00 @	3 87½
75,000				

1869.				Jan. 27.
7,000	tons	Lump	$4 10 @	437½
10,000	"	Steamboat	4 50 @	4 82½
12,000	"	Grate	4 77½ @	4 85
4,000	"	Egg	4 57½ @	4 70
20,000	"	Stove	6 25 @	6 32½
7,000	"	Chestnut	4 52½ @	4 60
60,000				

1869.				Dec. 29.
5,000	tons	Lump	$4 35 @	4 30
10,000	"	Steamboat	4 87½ @	4 30
10,000	"	Grate	5 17½ @	4 80
10,000	"	Egg	5 65 @	5 20
25,000	"	Stove	6 25 @	6 00
10,000	"	Chestnut	4 55 @	4 15
70,000				

1868.				Dec. 30.
10,000	tons	Lump	$4 37½ @	4 75
12,000	"	Steamboat	4 60 @	4 80
14,000	"	Grate	4 65 @	4 80
10,000	"	Egg	4 62½ @	4 82½
20,000	"	Stove	6 50 @	6 80
9,000	"	Chestnut	4 60 @	4 67½
75,000				

The average price obtained for each size at the sale of last Wednesday was, Lump, $4 14; Steamboat, $4 30½; Grate, $4 36; Egg, $4 25½; Stove, $4 88½; Chestnut, $3, 90½.

ITEMS.

"LACKAWANNA COAL."—The United States District Court for New York City has recently decided that a coal merchant who, for the last twenty years, had been selling "Scranton coal" and "Pittston coal" as "Lackawanna coal," with the tacit assent of the Delaware and Hudson Canal Company, had not infringed any right that the company might otherwise have possessed in the trade-mark title of "Lackawanna Coal." The Court held that a circular issued in 1860, cautioning consumers to "ask for Lackawanna that comes directly from the Delaware and Hudson Canal," and the fact that no notice was given to the merchant until 1866 of the alleged illegal use of the descriptive name, amounted to a license to use the word "Lackawanna," and operated as an equitable estoppel. The defendant, the merchant, alleged that the coal he sold came from the Lackawanna Valley, while the Canal Company asserted that it came from the Wyoming Valley.

NOTICE TO MINERS AND COAL OPERATORS.—The Committee on Mines and Mining, of the Pennsylvania State Senate, consisting of Muma, Connell, Howard, Turner, and Randall, will, on Tuesday, February 1, take up and consider the "Act providing for the health and safety of persons employed in coal mines," prepared and presented to the Senate by Senator Turner, of Luzerne, with a view to amend if need be, and report the same to the Senate for its action, when such as desire to present their views upon the subject will be heard.

PENNSYLVANIA AND NEW YORK CANAL AND RAILROAD CO.—Robert H. Sayre, Esq., Chief Engineer and Superintendent of the Lehigh Valley Railroad, has been chosen President of the Pennsylvania and New York Canal and Railroad Company.

Anthracite Coal Trade for 1869 and 1870.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending January 22, 1870, compared with week ending January 23, 1869:

COMPANIES.	1869. WEEK.	1869. TOTAL.	1870. WEEK.	1870. TOTAL.
*Phila. & Reading R.R.	29,753	2:5,464	27,319	309,480
†Schuylkill Canal				
Lehigh Valley R. R.	37,630	272,453	47,923	356,260
Lehigh and Sus. R. R.	21,729	98,915	21,327	55,971
*Lehigh Canal				
Scranton North	9,556	28,630	11,913	37,083
" South	28,836	86,484	33,824	98,146
Penn. Coal Co., rail	16,842	48,071	18,589	51,041
† " " " canal				
Del. and Hudson, rail, N.			14,054	39,699
" " south			2,176	5,291
Delaware & Hud. Can. N.				
" S.				
Shamokin	7,941	16,076	4,895	19,169
Trevorton	435	1,369	935	1,781
Short Mountain	1,023	2,368		
Lykens Valley Coal Co.	199	2,760		
† Wyoming South				
† " North				
P. N. Y. C. & R. R. Co.			5,233	26,361
Williamstown, Col'y	522	3,210	2,669	10,385
Total	154,524	797,740	191,487	1,003,638
1870			151,524	797,740
Increase			37,963	205,898

* Less coal transported for Company's use and Bituminous coal.
† Closed for the Season.

Bituminous Coal Trade, 1869 and 1870.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Jan. 22, 1870, compared with week ending Jan. 23, 1869.

COMPANIES.	1869. Week.	1869. Year.	1870. Week.	1870. Year.
B. & O. R. R.			2,668	6,871
C. & O. Canal				
H. & B. T. R. R.	6,937	17,495	2,309	8,474
Harrisburg & D.			2,497	48,961
L. V. R. R.			816	2,559
P. & N.Y. C. & R. Co.			3,712	25,681
	6,937	17,495	12,002	92,546

Schuylkill Coal Trade.

Report of Coal transported via the P. and R. R. for the week ending Jan. 20, 1870—less coal carried for Company's use, and Bituminous Coal:

For week	27,312 17
Previously this year	242,181 01
Total	300,494 18
Same time last year	275,464 00
Decrease	34,035 18
Amount sent same week 1868	29,750 00

Report of coal transported on the Philadelphia and Reading Railroad for the week ending Thursday, January 20, 1870:

From St. Clair	17,372 15
" Port Carbon	2,846 09
" Pottsville	856 07
" Schuylkill Haven	4 437 09
" Auburn	46 17
" Port Clinton	1,2?2 08
" Allentown and Alburtis	87 02
" Harrisburgh and Dauphin	2,497 04
Total paying freight	23,816 01
Coal for Company's use	2,145 15
Total for week	31,961 16
To same time last year	243,832 16
Total	275,794 12
To same time last year	283,042 19

Report of Coal Transported over Lehigh and Susquehanna Railroad.

Week ending January 22d, 1870—Compared with same time last year.

WHERE SHIPPED FROM	WEEK, 1870. tons cwt	WEEK, 1869. tons cwt	YEAR, 1870. tons cwt.	YEAR, 1869. tons cwt
Wyoming Region	1734 05	1367 04	38218 14	33770 15
Upper Lehigh Region	9 18 11	30 05 01	1700 01	9410 01
Hazleton Region	120 12	27 01	863 13	1?-6 17
Mauch Chunk Region	3433 00	4 93 19	15638 11	13485 12
Totals	21825 17	217.9 05	55970 19	58.14 14
Increase	97 12		2913 15	
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	20863 00	20858 18	53875 17	54932 02
Delivered at and above Mauch Chunk	650 09	353 07	1799 07	1361 13
Delivered to L. & B. R. at Plymouth Bridge	312 08	336 19	695 15	1529 10
L. V. R. R. at Sguar N.		180 01		521 00
Totals	21823 17	217.9 03	55970 19	58914 14
Of the above there was from Company's Mines.	4743 18	4920 05	18897 07	13412 18
Increase			5181 10	
Decrease	171 01			

Report of Coal Transported over Lehigh Valley Railroad

For the week ending January 22, 1870, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVL'Y. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	13.132 18	68,616 07	81,149 05
" Hazleton	27,845 13	166,446 16	194,292 09
" Upper Lehigh			
" Beaver Meadow	9,000 15	63,196 02	72,865 17
" Mahanoy	3,737 04	41,221 02	44,959 06
" Mauch Chunk	21 15	264 14	286 09
Total Anthracite	54,387 05	339,116 01	393,533 06
Bituminous Coal recv'd from Cata. R. R.			
N. C. R. R.			
E. P. R. R.			
P. & N.Y. C. & R.R. Co	816	1,743 00	2,559 00
Fall Creek			
Schroeder			
Towanda			
Total by rail and canal	55,203 05	340,859 01	396,092 06
Same time last year	38,187 00	252,236 18	290,423 18
Increase	17,016 05	88,622 03	105,668 08
Decrease			
Forwarded East from M'h Chunk by rail	47,923 08	308,337 07	356,260 15
Same time last year	37,631 04	234,822 05	272,453 09
Increase	10,292 04	73,515 02	83,807 06

RECAPITULATION.

Forwarded East from M'h Chunk by rail	47,923 08	308,337 07	356,260 15
To N. C. R. R., at Mount Carmel		115 00	115 00
Forwarded North from L. & B. Junction	5,333 12	20,617 17	25,951 09
To L. & S. R. R. at Packerton for rail	82 00	716 16	799 05
Delivered at M'h Chunk	20 11	171 11	192 02
Delivered on line of road above Mauch Chunk	274 13	1,561 03	1,835 16
Delivered above M. Chunk for use of L. V. R.R.	752 12	6,970 18	7,723 10
To L. & S. R.R., at P'n Hav., for railroad			
Do. for canal			
At M. Chunk for canal		655 09	655 09
Total Anthracite	54,387 05	339,149 01	393,533 06
Bituminous Coal	816 00	1,743 00	2 559 00
Total all kinds	55,203 05	340,889 01	396,092 06

Harrisburgh and Dauphin Coal Trade.

The following is the amount of Bituminous Coal transported via the P. and R. R. for the week ending Jan. 20 1870:

	Tons.
For week	2,497 04
Previously this year	46,462 15
Total	48,960 19

Penn. and N. Y. Canal and Railroad Co.

REPORT of Coal Transported via the Pennsylvania and New York Canal and Railroad Company, for week ending January 22, 1870:

	WEEK.	PREVIOUSLY.	TOTAL. Tons.
Anthracite	5 333 12	21,027 04	26,360 16
Bituminous	3,712 00	21,909 00	25,631 00
Total, Ant. and Bit.	9,045 12	42,936 04	52,041 16

Cumberland Coal Trade.

B. & O. RAILROAD

The shipments over the Baltimore & Ohio Railroad for the week ending Jan. 22, 1870, were as follows:

From Georges Creek via Piedmont.	Tons.
Consolidation Co	810 15
Borden Co.	364 13
Balt. & Hampshire Co.	128 09
Maryland Co.	
From Eckhart R. R.	
C. C. & I. Co.	992 11
Total.	2,663 00

Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

SCHUYLKILL.	AT NEW YORK, Jan. 28. R. A.	W. A.	AT PHILADELPHIA, Jan. 27. R. A.	W. A.
Lump	$— —	$5 00	— —	5 00
Steamer	— —	5 00	— —	5 00
Broken	— —	5 50	— —	— —
Egg	5 75 to —	5 50	— —	5 00
Stove	6 00 to —	5 75	— —	5 25
Chestnut	4 50 to —	5 00	— —	4 25
Pea	— —	— —	— —	— —
LEHIGH.				
Lump	— —	— —	— —	—
Steamer	— —	— —	— —	— —
Broken	— —	— —	— —	— —
Egg	— —	— —	— —	— —
Stove	— —	— —	— —	— —
Chestnut	— —	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A.	6 50	— —	— —
New England	"		— —	— —
Locust Dale	W. A.	6 00	— —	— —
Honey Brook, Le'h	W. A.	4 50 to 5 25	— —	— —
Spring Mount	" "	4 50 to 5 25	— —	— —
Sugar Creek	" "	4 50 to 5 25	— —	— —
Sugar Loaf	" "	4 50 to 5 25	— —	— —
Fulton	" "	4 50 to 5 25	— —	— —
Stout	" "	4 50 to 5 25	— —	— —
Old Comp'y's	" "	4 50 to 5 25	— —	— —
Cross Creek	" "	4 50 to 5 25	— —	— —
Chauncey	" "		— —	— —
Girardville	" "		— —	— —
McMichael	" "		— —	— —
Shamokin	" "	5 50	5 50	— —
Lykens Valley	" "		— —	— —
Broad Top	" "		4 75	— —
Hill & Harris	" "		5 50	— —
Henry Clay	" "		5 50	— —
Powelton	" "		5 25	— —

Prices for Coal at Mauch Chunk.

	F.L.	Bro.	Gra.	Eg.	Sto.	Ches.
Lehigh	$3 50	$4 00	$4 00	$4 00	$4 25	$3 75
Wilkesbarre	3 5)	4 00	4 00	4 00	4 2)	3 75

For freight to Elizabethport and to New York see "Freights."

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein	f.o.b. at Phila.		$5 25
" Lemon	"	"	5 00
Cumberland C. & I. Co.'s on board		N. Y.	7 50
Central C. & M. Co.'s	"	"	7 50
Consolidated Coal Co.'s	"	"	7 50

*Dealers in these coals may be found in our advertising columns.†

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton at E. Port	— —	— —	— —	— —	— —	— —
Pittston at N. Y	— —	— —	— —	— —	— —	— —
Lackawana at Weh'kn.	4 65	4 70	4 80	5 00	5 40	4 60
Wilk'b're at Hoboken	4 75	4 75	4 75	4 75	5 25	4 50
Old Co. Lehigh at Pt. Johnston	5 50	5 00	5 00	5 00	5'25	4 50
Lehigh at E. Port	5 25	5 50	5 00	5 00	6,25	4 50

For freights to different points, see "Freights."

Prices of Foreign Coals.

January, 1870.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 9 50@— —
" " Cannel	13 00@14 00
" House	14 50@17 50
" Orrel	14 00@16 00
Per ton 2,240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$16 00@18 00
" " Cannel	13 00@19 00
Per ton 2,000 lbs., delivered	

Prices of Gas Coals.

January, 1870.

PROVINCIAL.

Duty, $1 25.	Coarse. Gold.	Slack. Gold.
Block House	$1 75	@- 75
Gowrie	1 75	@- 75
Lingan	1 75	@- 75
Sydney	2 13½	@- 71½
Picton	2 13½	@1 1?½
Little Glace Bay	1 50	@1 00
Caledonia	1 50	@- 75

AMERICAN.

	Coarse. Currency.	Slack. Currency.
Westmoreland Co	— —	@- —
Despard Coal Co	$8 50	@8 00
Penn	— —	@- —
Newburg Orrel Gas	— —	@- —
West Fairmount Gas Coal	— —	@8 00

AT PHILADELPHIA.

Powelton	$7 80

Prices at Baltimore—Jan. 1870.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$7 75@7 90
Pittston and Plymouth	7 50@7 75
Shamokin Red or White Ash	6 75@7 00
Lykens Valley Red Ash	7 50@7 55
Trevorton, Red Ash	6 75@7 25
By retail, per ton of 2240 lbs. delivered	8 25@8 50
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	—@5 00
West Fairmount Gas f. o. b.	—@6 50

Prices at Georget'n, D.C., & Alexandria, Va.

January, 1870.

George's Creek and Cumberland f. o. b. for shipping..$4 75

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	—@— —
Lykens Valley	—@— —
Shamokin Red or White Ash	—@— —
Trevorton and Zebra Valley	—@— —

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven	$2 00
From Port Carbon, 8 cents per ton more.	

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Easton	$ 91
C. R. R., N. J., Easton to Elizabethport	1 19
Shipping expenses at Elizabethport	25
Warfage	10
Total	$2 35

MAUCH CHUNK TO PORT JOHNSON.

L. V. R. R. or L. & S. R. R from M. C. to Easton	$ 81
C. R. R., of N. J., Easton to Pt. Johnson	1 19
Shipping expenses	25
Warfage	10
Total	$2 25

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Easton	$ 81
Morris & Essex R. R. Easton to Hoboken	1 19
Shipping expenses	25
Warfage	10
Total	$2 35

TO SOUTH AMBOY.

L. V. R. R.	81
R. & D. R. R. / Cam. & Am. R. R.	1 28
Shipping Expenses	25
Total	$2 34

PENN HAVEN TO ELIZABETHPORT.

L. V. RR. Penn Haven to Easton	95
C. RR. of N. J. Easton to Elizabethport	1 19
Shipping expenses	25
Wharfage	10
Total	$2 49

Freights.—JANUARY, 1870.

TO EASTERN PORTS.	From Philadel'a.	From E. Portand Port Johnston	From Newburg	From Rondout
Stamford	$2 00	$1 10	$	$
Norwalk	2 25	1 15		
Bridgeport	2 00	1 10		
New Haven	2 25	— —		
Hartford	2 75			
New London	2 00	1 40		
Norwich and Sou	2 00	1 50		
Mystic	2 00	— —		
Stonington	2 00	1 40		
Sag Harbor	2 00	1 ?0		
Bristol	2 50	1 40		
Newport	2 50	1 40		
Fall River	2 50	1 40		
Providence	2 50	1 40		
Dighton	— —	— —		
Warren	— —	— —		
Pawtucket	2 25	— —		
New Bedford	2 25	1 40		
East Cambridge	3 00	— —		
Salem	3 00	2 00		
Newburyport	3 10	2 00		
Portsmouth, N. H.	3 35	2 00		
Rockport	— —	— —		
Saco	3 00	2 00		
Portland	3 00	2 00		
Bangor	3 00	— —		
Bath	3 00	2 30		
Middletown	— —	— —		
Amesbury	3 25	— —		
Boston	3 15	2 00		
Cambridgeport	3 00	— —		
Taunton	3 10	2 00		
Derby	2 00	— —		
New York	1 75	50		
Hackensack	1 95	— —		
Jersey City	1 75	50		
TO RIVER PORTS.				
Troy	— —	— —		
Albany	— —	— —		
Coeyman's	— —	— —		
Stuyvesant	— —	— —		
Cocksackie	— —	— —		
Hudson	— —	— —		
Catskill	— —	— —		
Poughkeepsie	— —	— —		
Fishkill	— —	— —		
Cold Spring	— —	— —		
Haverstraw	— —	50		
Nyack	1 60	50		
Sing Sing	1 60	— —		
Yonkers	— —	40		
New York	— —	— —		
Saugerties	— —	— —		
Rhinebeck	— —	— —		
Rondout	— —	— —		
Tarrytown	1 60	80		
West Point	— —	— —		

Foreign and Provincial Freights.

January, 1870.

Foreign.	
Newcastle and Ports on Tyne	£15@£17 keel
Liverpool	15s. —, do
TO NEW YORK.	
Provincial	
Sidney	$3 25
Lingan	3 25
Cow Bay	3 25
Port Caledonia	3 25
Little Glace Bay	3 25
TO BOSTON.	
Sydney	$2 75
Lingan	3 75
Cow Bay	3 25
Port Caledonia	3 00
Little Glace Bay	2 25

METALS.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Hand, Hoop, and Scroll, 1½ to 1¾ cents ₱ lb; Pig, $9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

Pig, Scotch No. 1, ₱ ton	32 00@34 00
Pig, American, No. 1	34 50@35 —
Pig, American, No. 2	— —@34 —
Pig, American, Forge	— —@33 —
Bar, Refined, English and American	—@2 85
Bar, Swedes, assorted sizes (gold)	85 00@87 50
Store Prices.	
Bar, Swedes, ord'y sizes, less 5 ₱ ct	120 —@130 —
Bar, Refined	85 —@— —
Bar, Common	— —@85 —
Scroll	110 —@145 —
Ovals and half-round	110 —@135 —
Band	110 —@— —
Horse Shoe	110 —@— —
Rods, ⅜ to 5-16 inch	90 —@140 —
Hoop	115 —@160 —
Nail rod, less 5 ₱ ct	— 8—@— 8½
Sheet, Russia, as to Nos. (gold)	— 11—@—12—
Sheet, Single, D. and T. Common	— 5½@— 7
Sheet, Galvanized	List 25@30 ₱ cent. discount.
Rails, English (gold), ₱ ton	56 50 @57 00
Rails, American, at Works in Pa	76 00 @77 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 16 @— 20
English Spring (2d and 1st quality)	— 7 @— 13
English Blister (2d and 1st quality)	— 11 @— 18
English Machinery	— 11½@— 14
English German (2d and 1st quality)	— 13 @— 15
American Blister "Black Diamond"	— 10½@— 16
American, Cast, Tool do.	— 19 @— —
American, Spring, do.	— 10 @— 13
American Machinery, do.	— — @— 13
American German, do.	— 10 @— 13

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 2½ cents ℔ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ℔ lb	— @— 32
Copper Bolts	— @— 33
Copper Braziers, 16oz. and over	— @— 33
Copper Nails	38 @— —
Copper, Old Sheathing, &c., clean	18 @— 19
Copper, Chili Pig	— @— —
Copper, American Ingot	21½@— 21⅝
Yellow Metal, New Sheating	— @— 26
Yellow Metal Bolts	— @— 26
Yellow Metal Nails	— @— 22

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cents ℔ lb: Pipe and Sheet, 2½ cents ℔ lb.

Galena, ℔ 100 lbs	$— @— —
Spanish (gold)	6 25 @6 37½
German, do.	6 20 @6 37½
English, do.	6 25 @6 75
Bar (net)	— @ 8 00
Pipe and Sheet (net)	— @ 8 00

TIN.—Duty: Pig, Bars, and Blocks, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent. ad val.

	Gold ℔ lb.
Banca	32 @32½
Straits	— @31
English	29¼@29½

PLATES.

Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ℔ box	$8 00 @8 25	$10 25 @10 75
I. C. Coke	6 75 @7 37½	8 50 @ 9 50
Coke Terne	— — @6 00	7 50 @ 8 00
Charcoal Terne	7 50 @8 00	9 25 @10 25

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ℔ 100 lb.

	Gold.
Plates, Foreign ℔ 100 lbs.	$6 00 @— —
Plates, Domestic ℔ lb.	10 @— 12

REMARKS.

IRON.—The market for both Scotch and American Pig remains quiet. The demand is light, and, as the stock is constantly increasing, prices are drooping. There is a moderate inquiry for Wrought Scrap at previously quoted rates, and we note sales of 175 tons light, part at $25. Old Rails are in demand, and we notice sales of 300 tons Double-headed at $45. cash. There is no change in Bar, but prices are nominally steady.

COPPER.—Manufactured is without change. The market has been quiet in Ingot since the large demand noted last week. We have only sales of 80,000 lb. Lake at 21⅛ @ 21¼ cents, and 25,000 lb. Baltimore at 21 cents, cash.

TIN.—Pig is in slight demand beyond the usual requirements of the trade. Sales—three tons English at 29½c., Straits 31c., and Banca 32½c. @ 32⅝c., all gold. In Plates there has been an improved business, and sales have been made of 500 bxs. assorted Charcoal Tin and 300 bxs. ½ d.x. at $8 25; 1,000 do. for forward delivery at $8 12½, gold; and 1,500 do. I. C. Coke on private terms. Terne's are quiet.

LEAD.—The market for Pig is very quiet, but prices remain unchanged. We note 50 tons ordinary Foreign sold at $6 25 @ $6 27½, gold. Bar, Pipe and Sheet eight cents, net cash.

STEEL.—All descriptions are dull at old figures. It is reported from Washington that the Committee of Ways and Means have agreed to raise the duty on the medium class of Steel imported in bars, sheets and rolls (value over 7 cents and not over 11 cents per lb.) from 3 cents, the present duty, to 3½ cents per lb.

ZINC.—American, dry, 7½c.; French, dry, 10½c.; Metallic, 11c.

MANGANESE—5½c. per lb.

Mining Stocks.

NEW YORK, Jan. 27, 1870.

Prices have not varied greatly since the quotations of last week. The demand continues dull, with a downward tendency.

Petroleum stocks are steady, with an advance in several instances since our last report.

	Bid.	Asked.
Rennehoff	20	—
Bergen Coal and Oil	36	40
Bliven Oil	—	1 00
Brevoort	—	—
Buchanan Farm	34	40
Central	87	70
Clinton Oil	—	—
Home Petroleum	5 00	6 25
National	—	1 00
New York and Alleghany	1 90	—
Northern Light	80	70
Pithole Creek	1 10	1 75
Rathbone Oil	20	25
Rynd Farm	41	46
Second National	—	—
Sherman & Barnsdale	—	—
United Petroleum Farms	20	25
United States	—	85

San Francisco Stock Market.

SAN FRANCISCO, January 26, 1870.

(By Telegraph.)	1st Board.	2d Board.
Savage	40	—
Crown Point	11	—
Yellow Jacket	53¾	54½
Kentucky	1 03	1 08
Cholar Potosi	19	19⅛
Gould & Curry	45	47
Ophir	13½	—
Alpha	12	—
Belcher	26	—
Imperial	30½	30
Hale & Norcross	1 60	1 61
Amador	—	—

Praise of the Press.

The Dubuque (Iowa) *Herald*, the foremost paper in its locality, thus speaks of the journal of December 15:—"THE ENGINEERING AND MINING JOURNAL.—We have received the December part of the ENGINEERING AND MINING JOURNAL, published by WESTERN AND CO., 37 Park Row, New York. Among the practically instructive articles with which this serial abounds, is one upon the proposed New York Arcade Railway. The illustrations presented upon the subject are so clear and intelligible as scarcely to require any explanation. It appears that the scheme thus intended for the relief of Broadway is neither a surface nor an underground railway, but a device which combines the chief advantages and is singularly free from the chief drawbacks of both. The mining summary is comprehensive and very carefully prepared. The illustrations are of a superior order, and include some very important subjects, as improvements in horizontal tubular steam boiler, self-oiling loose pulley, SWEET'S steam hammer, parabolic truss bridges. The whole magazine is full of interest, and ought to be found in the possession of every engineer and mechanic."

The New York *Stockholder*, one of our ablest and most reliable financial papers, under date of December 28, tenders us the following complimentary remarks: "The two publications of Messrs. WESTERN & CO., THE ENGINEERING AND MINING JOURNAL and THE MANUFACTURER AND BUILDER, are not only creditable but excellent journals, either of them worth far more than the cost to every intelligent person concerned in the arts which they promote."

Says the Philadelphia *City Item*, of December 18; "WESTERN & CO., New York, send us the December part of THE ENGINEERING AND MINING JOURNAL. This publication is of great and permanent value. It always contains a number of admirable illustrations, the reading is of interest and importance, and the type of good size and carefully printed."

Another Philadelphia paper, the *Commercial List*, of January 22, 1870, comes to us with the following: "THE ENGINEERING AND MINING JOURNAL.—This is a very valuable contribution to the current literature of the day, and is of special value to those engaged in mechanical arts. It is profusely illustrated with cuts, which add greatly to its value."

The Railroad and the Mines.

In the annual report of the Gould and Curry Mining Company, President Bull alludes to the advantages, present and prospective, of the Virginia and Truckee Railroad, towards which the trustees had advanced $40,000. In a previous report, it was estimated that these advantages would result in a saving of 34 per cent. in the annual expenses of the mine. Though the railroad is not yet completed, there has been already a marked reduction in the cost of wood and timber. There has also been a considerable saving in the amount of supplies necessary to be had on hand. At the close of 1868, the supplies at the mine amounted to over $80,000. To have provided for such supplies for the ensuing winter would have rendered an assessment of $7 per share necessary. The railroad will permit the company to draw their supplies as needed throughout the year, and hence the value of the supplies at present on hand aggregates only about $30,000. Instead of paying $15 per cord for wood, the price has been reduced to $11 50, while for spring delivery contracts are offered at $9 per cord.

Ship Building.

MESSRS. JOHN ENGLIS AND SON are hurrying to completion at their yard in Greenpoint, the new screw steamship City of Merida, for Messrs. ALEXANDER'S Mexican line. She is to be one of the finest specimens of marine architecture put afloat in many years, and is constructed in a superior manner, of the very best materials. She will be ready for launching about the 15th of February. Messrs. ENGLIS have just raised the frame of a new ferry boat for the Brooklyn and New York Ferry Company, which will be launched about the 1st of April. She will be of the class of the Superior, now on the route and of the following dimensions; length, one hundred and seventy feet; beam molded, thirty-three feet six inches; over all, fifty-eight feet; depth of hold, twelve feet six inches. Her machinery is being constructed at the Quintard Iron Works. That of the City of Merida is being furnished by the Delamater Iron Works.

The Cumberland Coal Trade.

The statistics of the production of the Cumberland (Md.) coal region for 1860 show that during that period 1,882,679 tons were mined, an increase of 552,226 tons over 1866. Of this quantity, 1,162,830 tons were sent to market by the Baltimore and Ohio Railroad, and 652,151 tons by the Chesapeake and Ohio Canal, and 67,688 were consumed along the lines of transportation. The aggregate production of the mines from 1842 to 1869 inclusive amounts to 14,835,986 tons, of which 8,475,669 tons were carried by the Cumberland and Pennsylvania Railroad, 3,284,881 by the Cumberland Coal and Iron Company's Railroad, 2,190,673 by the George's Creek and 883,823 by the Hampshire and Baltimore Company. These coal roads are feeders of the Baltimore and Ohio Railroad and of the Chesapeake and Ohio Canal.

Colorado Bullion.

THE Brown Silver Mining Company recently shipped East the largest mass of silver bullion ever produced in Colorado. The "button" weighed 683 pounds troy, 8196 ounces, currency value, $12,703. So says the *Colorado Miner*.

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col	P. P. Fullerton, 71 B'way	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00	10	12
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C.T.Whittington, 48 Broad	2,500,000	100 00		
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Central Union Gold					15	25
Consolidated Gregory	Colorado				1 90	1 95
Combination Silver	Nevada			100 00	1 50	
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5 000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col	J. P. Davies, 19 Cliff	306,000	1 00		
Empire Gold and Silver	BodieBluff, MonoCo.Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson, 155 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E	H. Adams, 71 Broadway	2,000,000			
Gregory	Colorado		1,250,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Grass Valley					17	21
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		
La Crosse Gold	Nevada Dist., Col	P. P. Fullerton, 71 B'way	1,000,000			
Lander Hill T. & S	Nevada	M.L.Catherwood,74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold					2	3
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12 000,000		8⅛	8⅛
Mariposa preferred	California	do. do.			16⅞	17½
Montana Go'd		G. De Cordova	400,000			
Montana M. L. & M. Co.	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Cal	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sprouil, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe, 10 Wall	2,000,000		5	
N. Y. & Montana M. & D.	Montana	F. A. Chapman, 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M		W. H. Mailler, 108 Wall				
Ophir Gold	Cometock Lode, Nev	L. C. Warner, 70 B'way	625,000			
Owyhee Gold		W. H. Smith, 43 Ex. Place	1,700,000			
Pahranagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		72	74
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000		67	69
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00	5	6
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewil, 19 Broad	1,000,000		1 00	
Silver Bend		F. W. Macy, 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen, 71 B'way	1,000,000			
Silver Peak & R. M	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	1 90	2 00
Social & Steptoe Con		T. H. O'Connor, 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Symonds Forks					45	75
Twin River Silver	Nevada	J. F. R. Hadden, 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts, 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Sibley, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Coal Co		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co		J. T. Rollins, 41 Pine	2,500,000			
Block House Coal		D. R. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00		
Clifton Iron Co		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		E. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co		E. Riscan, 90 B'way	5,000,000		31⅛	32
Derby Coal Co		W. S. Davison, 11 Broad				
Dover Coal and Iron Co		L. Chase, 88 Wall				
Del. & Hudson Canal Co			10,000,000	100 00		
Ebervale Coal		G.L Stout, Treas., 111 Br'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 43 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	300,000			
Kemble Coal & I. Co		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin, 112 B'way	100,000			
Lackawanna I. & C	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co		J. H. Rolston, 80 B'way	1,500,000			
Lehigh & Susquehanna					85	1 35
Mahanoy			400,000	100 00		
McNeal C. & I. Co		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co		G. Wrighton, 34 Wall				
Peekskill Iron Co		W. Murdock, 7 Nassau				
Pennsylvania Coal Co		C. H. Mead, 111 B'way	3,200,000	50 00		
Richmond Iron Co		C. H. Smith, 165 B'way	1,000,000			
Scotia Coal Co		I. N. Soper, 42 B'way	2,500,000			
Spring Mt. Coal		C. Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C		E. D. Webb, 77 Cedar	600,000			
Stout Coal Co		G. S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter, 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlow, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$500,000	25 00		
Davidson Copper					3	25
Eagle Harbor Copper	Michigan	W. H. Smith, 43 Ex. Place	500,000	25 00		
Evergreen Bluff Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			7
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex. P	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st	1,000 000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Ely, 191 B'way	500,000			
Wallkill Lead, asst		S. M. Pond, 70 B'way			4	5

MISCELLANEOUS.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Zinc Co		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co		H. Bogardus, 14 Pine				
Quicksilver					14½	15
Covill B. L. M. & M'f. Co		C. R. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	800,000			
N. Jersey Zinc Co	New Jersey	A. H. Farlin, 61 Maiden L'e	1,500,000			

Protoplasm.

THE word Protoplasm has recently been brought prominently before the reading public, in the discussions in reference to the formation and the organization of life. Professor HUXLEY, who first used the word, explains it by stating that "Protoplasm is a complex body, consisting almost entirely of carbon, hydrogen, oxygen and nitrogen." He then proceeds to apply the word to the different objects of the vegetable and animal creation, and says: "First. Ordinary plants consist of masses of protoplasm, each provided with a wooden case, associated together. The plant feeds, grows, multiplies, dies, and is resolved into simple compounds, which are chiefly carbonic acid, water and ammonia. Second. Ordinary animals consist of protoplasm, not inclosed in wooden cases, but imbedded in other matter, which result from the modification of protoplasm. The animal feeds, grows, multiplies, dies, and is resolved into similar compounds, which are chiefly carbonic acid, water, and ammonia. Third. Ordinary animals cannot make protoplasm, but must be supplied with it; ordinary plants can make it from carbonic acid, water and ammonia. Fourth. The matter contained in living bodies is continually undergoing a circulation from the not-living world." Meanwhile, *Punch* finds matter for laughter in this aspect of science, and perpetrates the following protoplastic valentine:

TO MY BELOVED VESTA.

Miss, I'm a Pensive Protoplasm,
Born in some pre-historic chasm.
I and my humble fellow-men
Are hydrogen, and oxygen,
And nitrogen, and carbon, too.
And so is Jane, and so are you.
In stagnant water swarm our brothers
And sisters, but we've many others,
Among them animalculæ,
And lizard's eggs—and so, you see,
My darling Vesta, show no pride,
Nor turn coquettish head aside,
Our pedigrees, as thus made out,
Are no great things to boast about.
The only comfort seems to be
In this—philosophers agree
That how a Protoplasm's made
Is mystery outside their trade.
And we are parts, so say the sages,
Of Life come down from Long Past Ages,
So let us haste in Hymen's bands
To join our Protoplastic hands,
And spend our gay organic life
As happy man and happy wife!

The Place Where Gold was First Discovered in California—Its Past and Present.

AN able correspondent of the San Francisco *Morning Call*—which journal, by the way, has recently been re-modeled and greatly improved—thus sketches the town of Coloma, the locality where gold was first discovered in California, and from which tidings went forth that startled the whole world, and caused an exodus from every quarter of the globe, such as stands unrivalled in the pages of history. The writer closes with a touching account of MARSHALL—the man who first discovered the precious metal—now living on the same spot, in the veriest poverty. He says:

"Coloma was the scene of the gold discovery in 1848. It was here that Sutter's mill stood on the banks of the creek, and one morning, when the water had been turned from the race, MARSHALL stepped upon the sandy river bed and found some pieces of yellow metal. His discovery created no sensation, but only excited curiosity as to what the curious stuff was. He took some of the pieces to the cabin of WEIMER, a fellow workman in the mill, who lived up on the hill-side, and they speculated upon its character. MRS. WEIMER boiled it in lye; they pickled it, tried all sorts of experiments with it, but its brightness increased, and it would not tarnish. They then became satisfied that it was precious gold, and the news of the discovery having been bruited about, the estimates of its importance were soon confirmed by the evidence of those who had seen the precious metal in its primitive state. The immediate results of this important discovery have formed a most important page in the history of the nineteenth century, and need not be dwelt upon at length. An immense immigration was immediately attracted to these shores, and the town of Coloma, then Sutter's Mill, was the goal most of them sought. All the ravines and hill sides thereabouts proved amazingly rich, an immense mining population centred there, and a flourishing, active, busy town sprang up like magic on the banks of that quiet stream, the stillness of whose air had only previously been broken by echoes of falling trees and the steady buzzing of the saw-mill. And Coloma was a lively camp. From morning to night, for more than ten years thereafter, its streets, or rather its street, was crowded from morning till night. Merchants made fortunes in supplying the trade that diverged from this point, radiating in many branches through the country; miners came down from the mountains and gulches, with their buckskin bags of glittering dust, and spent it as freely as water; the hotels were filled constantly, saloons ditto, and the clink of slugs and thud of dust-bags in the gambling saloons could be heard at all times. It was the county seat of El Dorado, when that county was in its prime, and in those good old days when to be a county official was equal in its pecuniary emoluments to the governing of a small European principality. On 'Court days,' the legal learning and talent of the State frequently gathered there, for in those unsettled times litigation was brisk, and fees were plentiful and liberal.

"As we entered the town, my attention was directed to a large two-story frame building, the doors and windows of which were gone, and the edifice was fast crumbling away. This was formerly the leading hotel of the town, and did a thriving business; its office crowded almost constantly, and in its saloon the constant services of two-barkeepers were required to dispense high-toned liquid to the thirsty crowd. The main street was well built up, containing many fire-proof buildings, while the hill-sides were sprinkled with cottages surrounded by neat gardens, orchards, and vineyards, giving it a home-like appearance, for which Coloma was always especially noted. But few of the old inhabitants are left there now, and in fact there are but few people in the town. Probably three-fourths of the buildings are unoccupied and deserted, the mines are nearly all abandoned, and the town is as nearly extinct as it well can be and yet exist. You might fire a cannon-ball down the main street without danger of hitting any one, unless some stray Chinaman should chance to get in the way, for the Chinese slip into these towns as the white men leave, and in their contentment with small wages, not only exist, but appear to be exceedingly happy. I took lunch at the only hotel in the place. It was a large two-storey frame building, having probably a frontage of sixty feet by one hundred feet in depth, with a large stable attached, and all in good order. The improvements upon this lot cost about $25,000, and how much do you suppose the present owner paid for the entire concern? Why, $750! And yet he was repining over his bargain, and trying to devise means to get his money out of the property. He proposes to take the doors and windows out of the hotel, take them to some railroad town, and use them in the construction of another hotel, and in this manner he has some hopes of getting even. Nearly all of the houses are supported on stilts, the ground underneath them having been 'mined out,' and many lot owners made good speculations in days gone by, in selling town lots for mining purposes. The street is still intact, and stands up, a high ridge, through a vast field of cobble stones. When the remaining white population shall have deserted the town, and appearances indicate that the day is not far distant, then the Chinese will no doubt mine the street, and may perhaps strike good diggings.

"THE OLD MILL SITE.

"I was curious to know the precise spot upon which Sutter's mill had stood, and a blacksmith came out of his shop and kindly showed me. It was 'down there, on the edge of the creek, where you see those two large granite boulders. The mill stood precisely where those boulders are.' I strolled down to the spot, picking my way over piles of loose cobbles, and followed the stream until I reached the spot. I was an 'Innocent abroad,' a 'Pilgrim' visiting, for the first time, a scene around which must naturally cluster more recollections, and give inspiration to deeper reflections, than any spot on this young Pacific slope. I have not the time to follow out at length the reflections that possessed me, but as I pitched a pebble into the stream, which must have fallen near the spot where Marshall picked up his glitter specimen, I thought of the effect which his discovery had had upon the world's history, of the great tide of humanity that surged here immediately after, the vast enterprises which it called into being, how the world was drawn hither by its magnetic influences, the Isthmus of Darien was spanned by a railroad—'every tie of which was a dead negro;' of the thousands of steamships that had time and again made their entries and their exits through the Golden Gate: the cities that have been built; the wealth of treasure that has flowed into the channels of tradé; and that grandest achievement of all, the Pacific Railroad. I thought of the beautiful, palace-like buildings of the metropolis; of the magnificent Capitol at Sacramento, with its elegant legislative chambers, resplendent with the embellishments of modern decorative art, and then I looked up to the hill side and saw the present home of MARSHALL—a picture of abject poverty, of toil, deprivation, and want. It is a little hut on the hill overlooking the town, its tin roof having apparently been made from the lining of a dry-goods box, and appears not much larger than a good sized dog-kennel. A few grape-vines are planted around the place and over the top of the hill, and this little spot, to which he has but a possessory, or squatter's title, is all the worldly possessions of MARSHALL, the discoverer of gold in California. Every day he toils from the time the sun appears in the East until his setting rays kiss the top of his humble cot, delving out a bare subsistence, yet always inspired with the hope of lucky strikes and a competence for his old age. And thus he has been toiling for over twenty years, while nations have arisen and fallen—while others have amassed wealth from his discovery, and the eyes of the world have been turned toward the land he first brought into notice. We boast of our generosity, open-handed liberality, gratitude, and of all the virtues with which a self-righteous people love to glorify themselves, but, to my mind, it is a shame and a disgrace to the State, as well as to the nation, that JOHN W. MARSHALL, the discoverer of gold in California, should thus be condemned to poverty and want, without a decent roof to cover his head."

Pumping Money.

HOWEVER singular and startling the above heading may appear, it accurately indicates the nature of the final process in the art of money-making, as practised at the Mint of Great Britain. Without entering into a detailed account of the manipulatory operations by which ingots of gold are transformed into sovereigns, it may be stated that the finishing touch which gives them their impressions and their milled edges, is always administered through the medium of an air-pump. Every coin of this, and indeed all other denominations which have emanated from the Mint since the year 1810, may therefore truly be said to have been pumped into the circulating channel. The pneumatic arrangement by which letters or postal packets are pumped through underground tubes from the General Post-office to Easton Square Station is but a modification of the pump and cylinder system of money stamping in force at the Mint. Should the atmospheric mode of letter carrying be extended to other districts of London, as is suggested, the air-pump will become at once our general postman and chief coiner.

Let us proceed to explain the means and contrivances by aid of which the operation of pumping sovereigns is performed on Tower Hill. The prime mover is a steam-engine, of twenty horse power, on the combined high and low pressure principle, and which was erected by the Messrs. RENNIE. Originally this was intended for pumping water from a deep well to supply the establishment. In 1851, however, Mr. NEWTON, the Mint Engineer, proposed that the engine should be made to pump coins as well as water, and showed how the thing could be done. The plan was approved by the authorities of the place, and under the inspection of its inventor, the Messrs. RENNIE realized it.

An air-pump constituted the great feature of the scheme. This was made on a new principle, and while of very simple construction, is found to work with great smoothness and efficiency. It consists of a cast iron cylinder closely resembling that of an ordinary steam-engine in external appearance. Internally it is very different. The piston is solid, but surrounded by rings of cast iron, pressed outwards so as to fit the cylinder by the action of steel springs. The base of the cylinder is a hollow casting of iron, or box, and so is its cover. These boxes contain the valves. In each there are sixty-four, and they are necessarily of small size. They are, in fact, nothing more than narrow strips of saw plate, each covering a slot or aperture, and screwed, at one end, to the seat. In both upper and lower boxes thirty-two of these miniature and silent valves open to the atmosphere, and thirty-two to the exhaust or vacuum tube. The pump is forty-two inches in diameter, and the piston has a stroke of thirty-six inches.

By this arrangement of valves, etc., the pump, which is worked directly from the main beam of the engine, is made double-acting—that is to say, it exhausts air during both the up and down stroke of the piston. A pipe, two hundred feet in length, connects the air-pump with the coining press machinery. The communication is made over the roof the building, and therein differs from the pneumatic letter tubes referred to, and which are carried underground. The cost of the whole contrivance, with its accessories, was not more than £400; and after seventeen years' working, during which time it has saved the country upwards of £3,000, it has never once got out of repair. Its inventor received thanks for his ingenuity, and nothing more. The connecting pipe of the air-pump dips at the proper point through the roof, and is extended downward to a vacuum chamber. This is a cylinder of cast iron, fifty feet long and thirty inches in diameter. It rests horizontally on the floor of the Mint pump-room, and in a line parallel to that of the eight coining presses. Along the top of the vacuum chamber, and each supported by a pipe opening into it, are ranged eight small cylinders without covers. These are furnished with pistons packed with leather, and are placed vertically. Rods, horse-head cranks, and levers, all of light construction, connect the pistons with the central screws of the stamping-presses. It will now be understood that once the air is pumped from below the pistons, these latter will descend by force of the atmospheric pressure on their surfaces. They do so really when the great air-pump is in action, and valves below the piston are made to open to the vacuum chamber; the air within the cylinders then rushes down to the exhausted tube, and is discharged again into the atmosphere, whilst the pistons descend to the bottoms of the cylinders, and drag after them the main screws or strikers of the presses. The instant that the dies—one of which is affixed to each screw—advance towards those resting below them, discs of gold are interposed by self-acting machinery, and enclosed by milled collars of hardened steel. By the force of impact resulting from the pistons falling in vacuum, as described, the blanks sustain heavy blows from the upper dies, which thus communicate the impressions that afterwards are so much admired. The steel collars form moulds, which serrate or indent the edges of the coins, and preserve their circularity whilst being struck. The press screws then rebound, carrying up their respective pistons. The pneumatic valves again open, the dies descend upon new blanks furnished by mechanical fingers. Another batch of sovereigns is pumped into existence, and so long as the air-pump is exhausting the chamber, and fresh blanks are forthcoming, streams of coins, glittering like beetles' wings in the sunshine, will flow down from the presses into reservoirs arranged to intercept and make them prisoners. Thus it is that from day to day, during a gold coinage, the operation of creating sovereigns is carried on at the Mint, and thus it has happened that the Newton air-pump has caused one hundred millions of them, weighing in the aggregate more than a thousand tons to be added to the gold currency of the world. "Pumping sovereigns by wholesale" is therefore by no means an inappropriate title for the present article.—*London Engineering.*

A New Organization.

ST. LOUIS INSTITUTE OF ARCHITECTS.

SECRETARY'S OFFICE, 305½ Olive St.,
ST. LOUIS, Jan. 17, 1870.

TO THE EDITOR—Sir: The St. Louis Institute of Architects was organized in this city on Jan. 11, and the officers for 1870 elected as follows:

President—THOMAS WALSH.
Trustees—GEO. J. BARNETT, J. F. MITCHELL, M. RANDOLPH.
Secretary and Librarian—GEO. D. RAND.
Treasurer—R. DESBONNE.

This society is formed for the mutual benefit and improvement of the architects of St. Louis. It proposes to establish a a library, for which any contribution will be thankfully received; and it is hoped that the society will do much good, not only to its members but also to the public.

GEO. D. RAND, *Secretary.*

THE ENGINEERING AND MINING JOURNAL.

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ROSSITER W. RAYMOND, Ph. D., Editor,

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The Engineers of the Navy.

THE position assumed by the line officers of the United States Navy towards the staff, is a disgrace to this country, to democratic government, and to science. The Navy is the most intensely and absurdly aristocratic organization known to our laws. The Army is far more democratic, and not a whit, on that account, less efficient. In fact, the arrogance of the line of the Navy is fast destroying the efficiency of the staff, which, whatever the young gentlemen from Annapolis may think, is nevertheless quite essential to the successful management of this arm of the service.

Let us briefly consider the duties and deserts of these two departments. The regular line officer is educated by the Government, at a cost of $26,000 for each cadet. When a class is graduated, the cadets rank as ensigns. They must be sent to sea to learn their profession practically; and for this purpose a frigate is sent, with the whole class on board, to make a pleasure trip under roving commission. The expense of keeping a large frigate in commission is not far from half a million per annum. After this, the young officers are detailed to different ships; and when they have seen four or five years' active service, they are in a position to begin to repay some of the labor and expense that has been bestowed upon them.

The staff comprises chiefly surgeons, paymasters, and engineers. The surgeons must have previously passed through a regular medical course at their own expense, and received a medical degree. They are then subjected to an examination so severe, that only five per cent. of the graduates of medical colleges who apply are able to pass. The paymasters are obliged to furnish high testimonials of business ability and moral character, and to furnish bonds for a large amount of money. The engineers must likewise be theoretically and practically expert in their profession, and this expertness has been acquired without costing the government a cent. All these classes enter the navy as grown men and responsible citizens.

The line demands that the staff shall enter the navy with the rank of ensign, which is borne by the Annapolis boys when they are only fit to be messengers on board ship; and the avowed object of new measures now proposed, is to make all the staff junior to all the line. Let no one be misled by the use of the word rank in this connection. The question involved is not military but social. The staff corps of the army do not command troops; and a quartermaster or engineer, though he be a major-general, may be under the orders of a line officer in command. Nobody proposes to let paymasters or surgeons command vessels, or exempt them from the duty of obedience to those who do command, or put them in the line of succession to command, or of promotion outside of their own corps. Nobody would object, unless on the ground of its superfluousness, to a legal provision forbidding all these bugbears of insubordination. The line is well aware of this fact; but its spirit arises from very different motives. It is a spirit of conceit and social exclusiveness. Officers who do not understand, as a general rule, such vulgar things as steam-machinery, medicine, anatomy, or keeping accounts, propose to keep themselves, as "gentlemen," above the "apothecaries," "clerks," and "coal-heavers," who do understand them. This is the worst form of aristocracy, the aristocracy of ignorance.

The position of the engineers is what concerns us most nearly. The knowledge of steam-engineering acquired by the cadets at Annapolis is merely general and theoretical. Under the pressure of public opinion, a separate professorship of this branch has been established, but the prejudice against it is so strong among the cadets that hardly any of them devote themselves to it. Perhaps they are not to blame, considering the insulting treatment which awaits them if they choose to be engineers instead of "gentlemen." The accomplished engineer who for some years filled the professorship alluded to, was not long ago removed from that position, and ordered to a small gunboat, where he found himself outranked and socially ostracised by the very youngsters whom he had but just graduated from his class-room. Of course he resigned, and this is the course which all the best staff officers of the navy will follow, if they are to be treated with such combined tyranny, stupidity, and malice. Already it is impossible to fill the vacancies in the medical corps with competent surgeons. Men who are able to command respect and success outside of the navy will not enter it to be insulted by pensioners in jackets. Nor will competent engineers continue to serve in a capacity where merit and education are positive disqualifications. If they are treated as mere "coal-heavers," they will resign their places to coal-heavers. No doubt this result would tickle the proud and sensitive line; but what will be its effect upon the service and the country?

It is too late for stripes and shoulder-straps to sneer at brains and hands. Either our gentlemanly young sea-kings must trouble themselves to learn about steam and machinery, or they must trouble themselves to look up, not down, to their superiors in that knowledge. There is no need of any ill-feeling between the different corps; but if either must be exalted at the expense of the other, why should not the scientific branch strut around, and speak of the line as "those fellows that we keep to attend to the police-duty, and now and then do the fighting, you know?" How would the middies like that?

Salting Roads.

THE reports from London seem quite favorable to the practice of sprinkling macadamized roads with a solution of salt and chloride of calcium to lay the dust. For every gallon of water, one pound of common salt and one pound of chloride of calcium are used. When the water is poured on, these salts dissolve speedily; and it is claimed that the effect of the solution, sprinkled upon macadamized roads, is to harden the surface so that, even after it is dry, dust is not easily formed upon it. The roads are said to last much longer, as must be the case, indeed, if the foregoing statement is well founded; since dust is the product of their wear. The storekeepers along the streets and roads thus treated express much satisfaction, declaring that their stores, which were formerly full of dust, are now quite free from it. As the chlorine compounds are preventives of decay, it is also asserted that this treatment exerts a sanitary effect upon the air. Moreover, the chloride of calcium is a hygroscopic salt, attracting water from the atmosphere, and thus keeping the road moist much longer than pure water could. The economy of water thus secured is no small advantage in large cities. Finally, the chlorides alluded to are cheap, and may be obtained in any desired quantity.

If salt water is really to be recommended for this purpose, it is fortunate for New York that we have an abundant supply of it on both sides of the city. Chlorides are not so cheap here as in England; and if we should attempt to save Croton water by dissolving two pounds of solid salt in every gallon used, we might find the expedient costly. Water is almost too cheap to be profitably adulterated in that way. But the plan of flushing our streets with brine from the harbor obviates this objection, besides possessing decided advantages over mere sprinkling. The latter simply lays the dust, without removing noxious accumulations; but an adequate flushing would wash the pavements clean. It was proposed to add chloride of calcium to the sea-water, for sprinkling purposes, on account of its hygroscopic properties, already mentioned; and, if we mistake not, the experiment was tried toward the close of last summer, in the Central Park.

On the other hand, there are serious objections to the use of such materials, especially in concentrated solutions and by sprinkling. In the winter time the effect of salt is to thaw the ice and snow, producing premature slush, and generating at the same time an intensely cold temperature, which freezes the feet of horses. Again, the continued sprinkling of streets with chloride solutions gradually accumulates large quantities of these salts on the surface; and the consequent evolution of chlorine is highly destructive to the soles of boots and shoes. It might also be expected to attack wagon-tires, lamp-posts, and all metallic surfaces exposed to it. Finally, the alleged sanitary advantages of this treatment are possibly counterbalanced by sanitary evils. Sea air is indeed preventive or curative of some diseases. It tends to counteract malaria, for instance; but it has its own train of disorders, principally affecting the lungs; and many persons cannot live at the sea coast on this account. The free use of chlorides in the streets would produce an artificial sea air, worse in these respects than the natural. But a more serious and easily comprehensible source of disease would be the hygroscopic property of the chloride of calcium. Every physician knows that the greater number of diseases begin with colds; and that the most frequent cause of colds is dampness under foot. It is put forward as one of the advantages of the salt referred to, that it will keep the streets damp! This is a consummation devoutly to be abhorred and abjured. We are scarcely surprised to read, in a counter-report from England, that diptheria, croup, fevers, etc., are the results, along the line of road, of the use of salt on the streets.

The abundant use, by flushing, of the natural brine which is a dilute solution of salts, may not be open to these objections, though even that should be carefully tested, in its effect upon vital statistics; but the perpetual deliquescence produced by concentrated solutions, sprinkled on the roads, is likely to cause evils greater than those which it is supposed to cure.

American Students at Freiberg.

DR. W. C. CATTELL, the genial and accomplished President of Lafayette College, Easton, Pennsylvania, who is spending a year or two in the inspection of foreign scientific schools, has recently visited the ancient and celebrated *Bergakademie* of Freiberg, Saxony; and we take the liberty of extracting from one of his private letters, the following items as to the number and nativity of the students at present enrolled. As the catalogue for the year will not be published for two months or more, this information, taken directly from the registrar's books, is new and trustworthy, as well as interesting.

The present number of students is only seventy-eight. Of these, seventeen are from Saxony, and the rest are gathered out of many nations. Spain, France, Greece, Holland and Denmark contribute together five students—in other words, just one apiece. Italy and Switzerland have each two representations; Austria has three; Norway and Sweden, four; Prussia, Russia and England, four each. Thirty-three students are registered as Americans; but of these, Mexico, Chili and Peru have two each. The rest are from the United States. The regulation requiring the place of nativity to be given upon matriculation is not strictly enforced upon other than native students; and it depends mainly upon the whim of the student himself, whether he gives the name of the town, or the State, from which he hails. Of the United States students for the present year, seven are registered from New York, and seven from the Southern States, Virginia claiming two, and Louisiana, Alabama, South Carolina, Missouri and Kentucky each one.

DR. CATTELL'S inspection of foreign technical and scientific schools has been extended through England, France, Norway, Sweden, Denmark, Russia and Germany; and we do not doubt that its results will be seen in the curriculum of the flourishing and progressive institution over which he presides, and also felt in the advancement of scientific education, and educational science, in this country.

Mining Review.

WE give a large space this week, and we shall devote nearly as much hereafter, to copious extracts from the admirable annual mining review of the San Francisco *Commercial Herald*. It appears from this elaborate survey that the aggregate product of gold and silver mining this year on the Pacific slope has been much less than it was last year, while, nevertheless, the average success of individual enterprises is said to have been greater. The only hypothesis which reconciles these two statements is that of a large reduction in the number of those engaged in mining. Without endorsing the statements of the *Herald*, any further than by recognizing the high authority of the source, we may say that such a reduction of active miners has actually taken place. It is not, however, the number of those who have forsaken mining and adopted some other profession, which causes this reduction. A far greater effect is due to the inactivity for nearly half the season, for want of water, of the majority of the placer miners, (or, more exactly, their activity unproductive of bullion), and the voluntary idleness of many quartz-miners engaged in strikes. The loss of three months' productive labor by twenty thousand men will account for a large portion of this year's deficit, without discouraging us as to the future.

Presence of Salt in Sea Air.

FROM a series of observations made at Monaco, on the shores of the Mediterranean, Dr. D'HERCOURT concludes that there is always on the sea shores an atmosphere impregnated with saline particles; this layer of air has, at the above-named place, some five hundred metres' horizontal, and some sixty metres' vertical extent. This impregnation of salt is due to what the author terms "pulverization" of the sea water by the breaking up of the surf, and is not directly influenced by either barometric pressure, hygrometric state of the atmosphere, or its temperature. This hydro-mineral dust, (*poussière*) as it is called by the author, is, unless there happen to exist near the coast physical obstacles, in the shape of high mountains, carried far away inland, and is not to be confounded with what is of more coarse nature, and termed "spray," which is only quite local, and produced when a gale of wind blows. The author states that, even on calm days in winter, the atmosphere near Monaco is at least up to a height of seventy metres, and some few miles inland impregnated with this hydro-mineral dust. There is no tide (rise or fall of water) perceptible in the sea alluded to.

Collapse in High Life.

THERE was a balloon ascension at Atlanta, Georgia, on New Year's Day, Dr. GILBERT HASSE going up alone, and the *Era* tells the following in relation to it: "When the balloon had reached the height of about one mile, those who were watching it were horrified to see it explode and collapse in the upper air. For about an hour the anxiety was very intense, when, to the astonishment of every one, the doctor rode in, sound in body. The doctor fell about three miles out of town, and the only injury he sustained was a few scratches from some bushes in which he fell."

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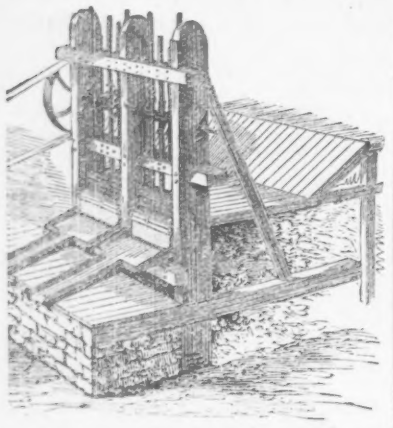

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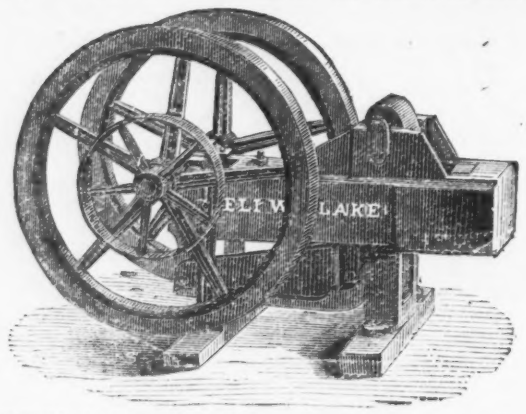

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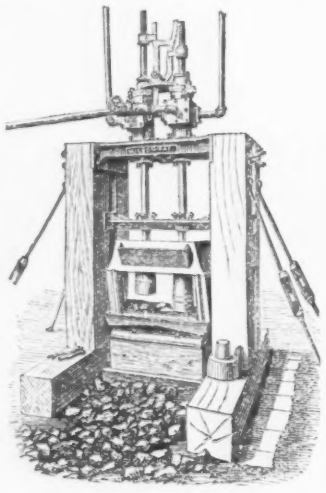

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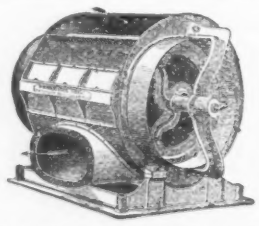

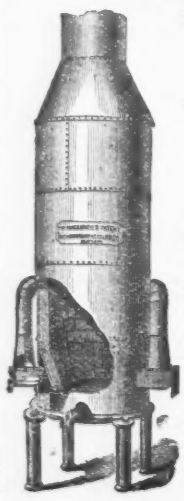

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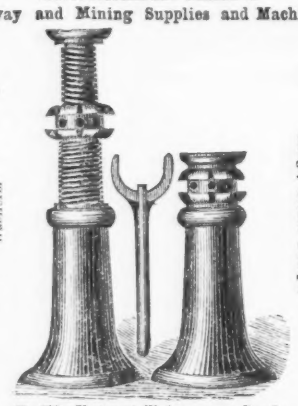

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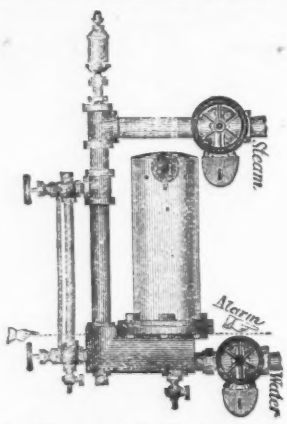

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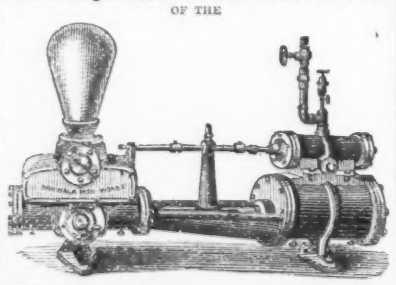

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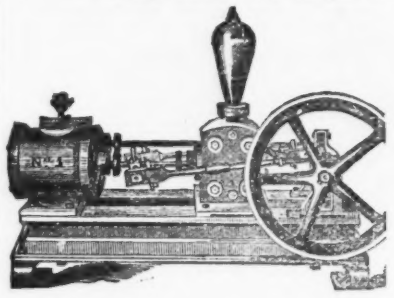

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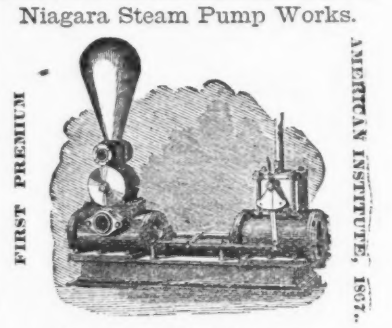

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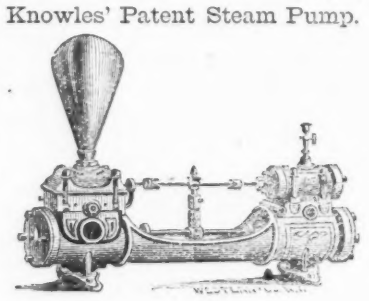

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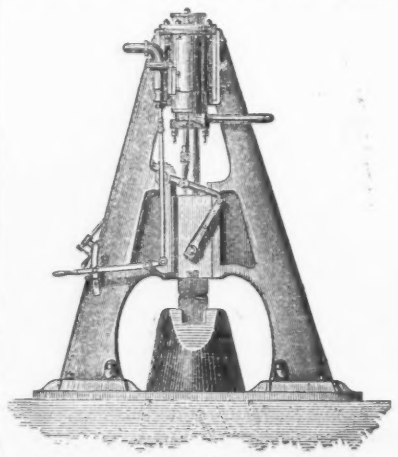

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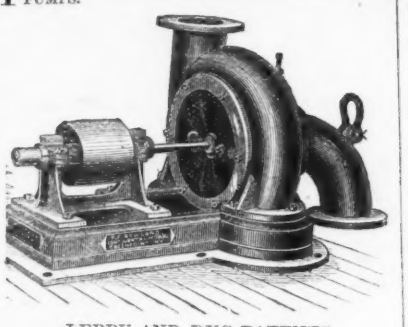

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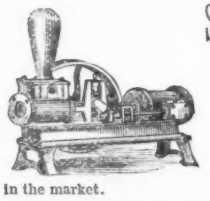

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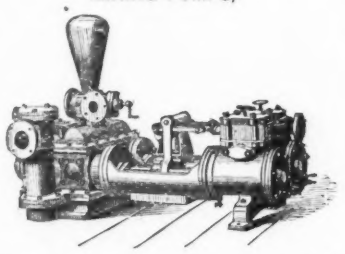

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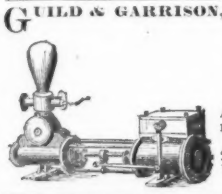

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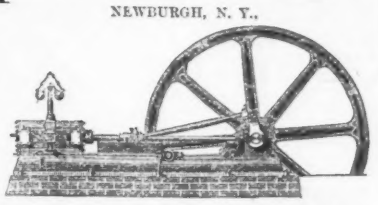

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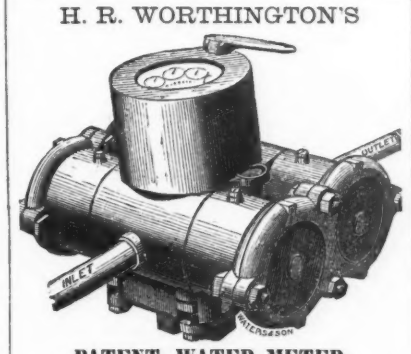

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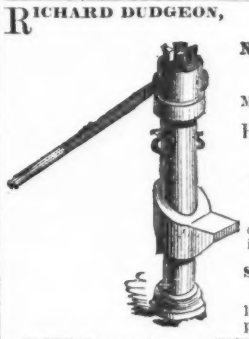

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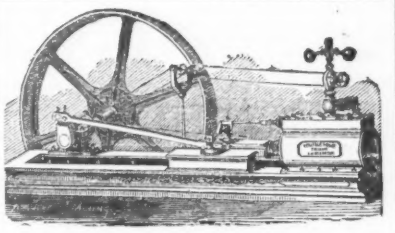

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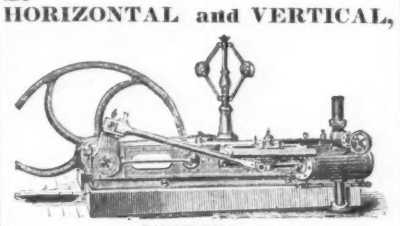

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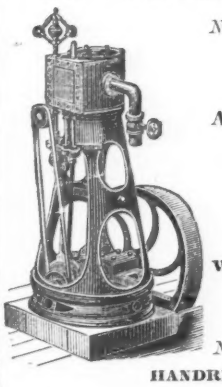

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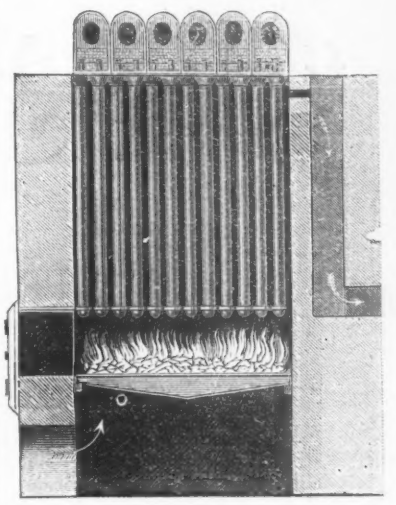

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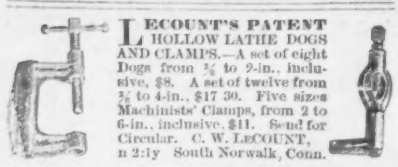

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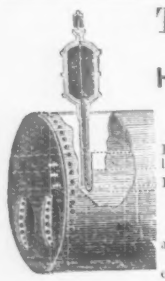

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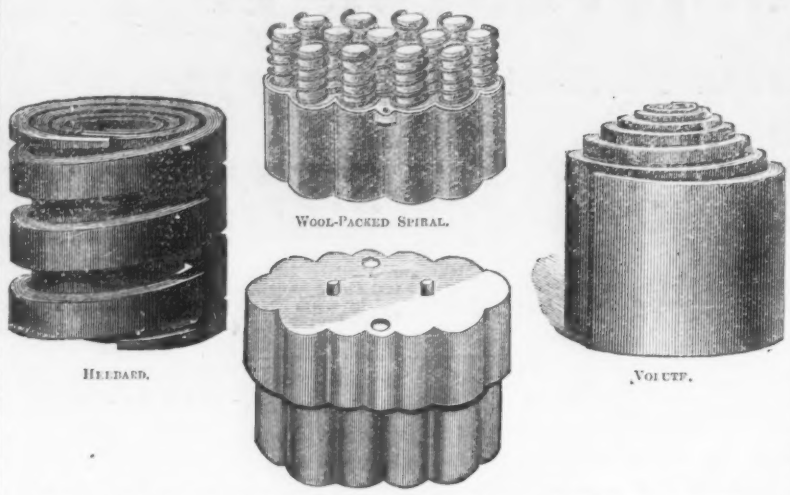

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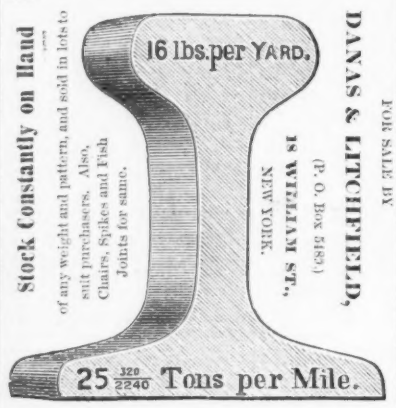
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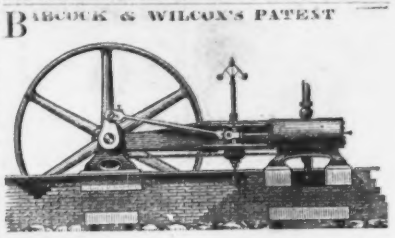

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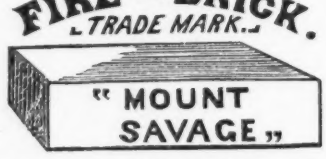

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